

COUNTY



ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR

❖ 1897. ❖

BY

JOHN E. GOULD

M.D. Lond., D.P.H. Camb., M.R.C.S., L.R.C.P.

Bolton :

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1898.

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*Sanitary Department,**Town Hall, Bolton,**March 9th, 1898.*

GENTLEMEN,

The report for 1897, which I now have the honor of presenting to you, is on the same lines as that of 1896.

It is divided into three parts—(1) vital and mortal statistics, (2) infectious diseases, and (3) sanitary work.

The tables inserted are those that are necessary for comparison with other towns, and for permanent record.

The report of sanitary work is rather longer than usual, owing to the fact that I have considered it necessary to commence a revision of the various branches of the work supervised by this department. Last year I presented a report on common lodging-houses; and this year special reports have been made on

- (1) Bakehouses.
- (2) Slaughterhouses.
- (3) Smoke abatement.
- (4) Insanitary and insufficient closet accommodation.

During the year the Sanitary Committee have passed resolutions, which have been confirmed by the Council,

- (1) To apply to the Local Government Board for £10,000 for the conversion of close's.
- (2) To borrow £20,000 for the demolition of insanitary property.
- (3) For extension of the Fever Hospital at a cost of £6,000
- (4) To erect a public bath.
- (5) To build underground urinals.

Revised bye-laws for common lodging-houses have been confirmed by the Local Government Board, and bye-laws for houses let in lodgings adopted.

I have to thank the Sanitary Staff, and especially the Clerks, for their assistance in the preparation of this report, and the Committee for their cordial support and the consideration they have shown to me personally.

I am,

Your obedient Servant,

JOHN E. GOULD,

Medical Officer of Health.

To the Sanitary Committee.



SANITARY COMMITTEE.

The Mayor :

Lieut.-Colonel Sir B. A. DOBSON, J.P.

Chairman :

Mr. Ald. J. E. SCOWCROFT, M.D., F.R.C.S., J.P.

Vice-Chairman :

Mr. Coun. T. E. FLITCROFT, L.R.C.P., &c.

Mr. Ald. TONG.

Mr. Coun. BLACKBURN.

Mr. Coun. J. FLITCROFT.

Mr. Coun. GREENWOOD.

Mr. Coun. HARGRAVES.

Mr. Coun. J. HASLAM.

Mr. Coun. W. H. HORROCKS.

Mr. Coun. KEARSLEY.

Mr. Coun. LYTHGOE.

Mr. Coun. MELLING.

Mr. Coun. PANTON, M.D.

Mr. Coun. RUTTER.

Mr. Coun. SMITH.

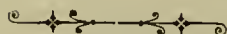
Mr. Coun. UTTLEY.

SUMMARY OF VITAL AND MORTAL STATISTICS, 1897.



Position	—	Lat. 53° 35' N.	Long. 2° 37' W.
Average Elevation (above sea level)...	365ft.		
Area	2361 Acres.		
Population	121,433.		
Density	51·5 Persons per Acre.		
Inhabited Houses (1891)	23,523.		
New Houses Certified (1892-1897)	3,279.		
New Houses Certified (1897)	783.		
Rateable Value (March 1897)	£470,918.		
Births	3,985.		
Birth-rate	32·8.		
Deaths	2,671.		
Death-rate (Crude)	21·9.		
„ (Corrected)	24·8.		
Infantile Mortality	184.		
Zymotic Death-rate (seven Chief Zymotics)	4·16.		
Diarrhœa Death-rate	1·29.		
Estimated Increase of Population	1,062.		
Natural Increase, i.e., Excess of Births over Deaths	1,318.		
Rainfall	43·8in.		

VITAL AND MORTAL STATISTICS.



Position and Soil.—The district is deeply overspread by boulder clay and sand, and lies on the undulating plains of the coal-measures in the central portion of the Lancashire coal-field. The elevation of the Borough varies from 230 to 500 feet above sea-level.

Area and Population.—The population for the middle of 1897 was 121,433, the area 2,361 acres, giving a density of 51·5 persons per acre, which was only exceeded by two of the larger towns, viz., London, 59·8, and West Ham, 58·2. The acreage, population, and density of each of the nine wards are given in table 1.

TABLE I.

Ward Populations and Densities.

Year.	Population in Wards.								Density (Persons to an Acre) in Wards.											
	Borough.	Exchange.	Bradford.	Derby.	Runworth.	North.	East.	Church.	Halliwell.	West.	Borough.	Exchange.	Bradford.	Derby.	Runworth.	North.	East.	Church.	Halliwell.	West.
1881	105414	9398	17961	15411	2998	5915	12340	7045	10664	23682	44'6	89'5	63'0	51'3	18'3	39'4	77'1	18'0	29'4	52'6
1891	115253	7699	18736	17319	4555	6597	11697	8682	13894	26074	43'8	73'3	65'7	57'7	27'9	43'9	73'1	22'2	38'8	57'9
1896	120380	7250	18890	18130	5630	6890	11313	9520	15770	26985	50'9	69'0	66'3	60'4	34'5	44'2	70'7	24'4	44'0	59'9
1897	121433	7252	18952	18302	5759	6943	11313	9665	16022	27225	51'5	69'0	66'4	61'0	35'3	44'5	70'7	24'7	44'7	60'5

Births.—3,985 births were registered, as compared with 3,792 in 1896; the birth-rate was 32·8, and slightly above the average for the last 10 years. The birth-rate for London was 30·0; and for the 33 great towns 30·7.

The percentage of illegitimate children to the total births in each ward and the infantile mortality in legitimate and illegitimate children, are given in table II.

TABLE II.

Legitimate and Illegitimate Births and Deaths under One Year in Wards.

Wards.	Births.			Deaths under One Year.		Proportion of Deaths under One Year to 1,000 Births.		
	Total.	Ille- gitimate.	Per cent of Ille- gitimate Births to Total Births.	Total.	Ille- gitimate.	Total or Infantile Mor- tality.	Legiti- mate.	Illegiti- mate.
Exchange ...	227	14	6·1	56	7	247	230	500
Bradford ...	678	28	4·1	126	5	186	186	178
Derby	652	23	3·5	100	8	153	146	347
Rumworth ...	170	2	1·1	27	1	159	154	500
North	220	4	1·8	40	4	182	166	1000
East	350	24	6·8	86	3	246	254	125
Church	201	4	1·9	31	—	154	157	—
Halliwell ...	600	19	3·1	107	6	178	173	315
West	858	19	2·2	155	2	181	182	105
Workhouse..	29	17	58·6	4	1	137	250	58
Borough	3985	154	3·8	732	37	184	181	240

Deaths.—2,671 deaths were registered in 1897, as compared with 2,496 in 1896, the death-rate (crude) being 21·9 per 1,000 per annum. The figures take into account the deaths of 22 Bolton inhabitants who died in lunatic asylums outside the Borough, and also of 18 visitors who died in the Bolton Infirmary. It compares favourably with the average death-rate for the 10 years 1887-1896, which was 22·2, but is higher than the death-rate for 1896.

The death-rate for the 33 great towns was 19·0, and there were five towns with a higher death-rate than Bolton, viz., Liverpool, Preston, Manchester, Salford, and Wolverhampton, the true position of Bolton, compared with other towns, being given by the corrected death-rate and the comparative mortality figure in table V.

The ward death-rates varied from 17·1 in Church Ward to 27·7 East Ward, those higher than the Borough being as follows :—

Ward.	Death-rate.		Density.		Birth-rate.
East	27·7	...	70·7	...	30·9
Exchange	26·3	...	69·0	...	31·3
Bradford	23·2	...	66·4	...	31·3
Halliwell	21·9	...	44·7	...	37·4

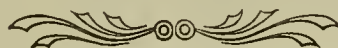


TABLE III.

**Populations, Densities, Birth-rates and Death-rates in
previous Years.**

Year.	Population.	Density.	Births.	Birth-rate.	Deaths.	Death-rate.
1773	5600	3'0				
1791-1800	14437	7'8				
1801-1810	20444	11'1				
1811-1820	27364	14'8				
1821-1830	37240	20'2				
*1831-1840	46579	25'3				
1841-1850	55167	29'9				
1851-1860	61645	33'5				30'7
1861-1870	75999	41'2				27'5
1871	82850	45'0				26'1
1872	85783	46'6				28'0
1873	88716	48'2				23'3
1874	91651	49'8	3526	38'6	2219	24'3
1875	92800	50'4	3552	38'6	2403	26'0
1876	94300	51'2	3722	40'1	2199	23'6
1877	95000	51'6	3596	38'0	2226	23'5
†1878	105000	44'4	3952	37'6	2313	22'0
1879	105000	44'4	3897	37'0	2233	21'0
1880	106700	45'4	4644	33'9	2835	20'5
1871-1880	94880	47'7	3841	37'6	2346	23'8
1881	105414	47'6	3811	36'1	2022	19'1
1882	106767	45'2	3834	35'9	2277	21'3
1883	107862	45'6	3697	34'2	2157	19'9
1884	108968	46'1	3701	33'9	2615	24'0
1885	110085	46'5	3788	34'4	2282	20'7
1881-1885	107819	45'6	3766	34'9	2270	21'0
1886	111214	47'1	3786	34'0	2572	23'1
1887	112354	47'5	3627	32'3	2393	21'2
1888	113506	48'0	3729	32'8	2453	21'6
1889	114670	48'5	3759	32'7	2528	22'0
1890	115846	49'0	3726	32'1	2986	25'8
1886-1890	113518	48'0	3725	32'7	2586	22'7
1891	115253	48'8	3914	33'9	2516	21'8
1892	116261	40'2	3769	32'4	2648	22'7
1893	117278	49'6	3874	33'0	2813	23'9
1894	118309	50'1	3719	31'4	2215	18'7
1895	119337	50'5	3960	33'1	2862	23'9
1891-1895	117286	49'6	3847	32'7	2610	22'2
1896	120380	50'9	3792	31'7	2496	20'7
1897	121433	51'5	3985	32'8	2671	21'9

* Incorporation in 1838 with 48,000 population and 1840 acres.

† Added in 1878 part of Rumworth with 163 acres and 3,000 population,
and part of Halliwell with 358 acres and 10,000 population.

Cities and Boroughs	Estimated Population in the middle of 1897	Per- sons to an Acre 1897	Annual Rate per 1000 living.										Deaths under 1 year to 1000 Births		Annual Death Rate per 1000 living.		Percentage to Total Deaths				
			Deaths from						Deaths	Principal Zymotic Diseases	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Fever	Diarrhoea	Violence	Inquest Cases	Deaths in Public Institutions	Unclassified Causes of Death
			Births	Deaths	Principal Diseases	Smallpox	Measles	Scarlet Fever														Diphtheria	Whooping Cough	Fever	Diarrhoea	Violence
33 TOWNS	10992524	35.5	30.7	19.0	2.86	..	.55	.18	.31	.40	.17	1.24	.71	176	10.3	70.3	7.5	20.6	1.3		
London	4463169	59.8	30.0	18.1	2.59	..	.43	.17	.50	.41	.13	.92	.77	158	10.0	67.1	9.3	29.3	0.6		
West Ham	273682	58.2	32.1	15.6	2.62	..	.51	.11	.37	.36	.17	1.03	.55	171	8.0	59.1	6.2	10.6	2.7		
Croydon	121171	13.4	24.9	13.0	0.68	..	.14	.10	.06	.25	.07	.79	.45	134	6.0	58.5	7.7	17.5	—		
Brighton	121401	48.0	24.6	15.0	1.64	..	.14	.10	.09	.20	.18	.91	.43	142	7.3	57.2	6.5	21.2	0.7		
Portsmouth	182585	39.1	26.8	16.1	2.54	..	.19	.06	.15	.35	.23	1.54	.55	168	7.8	62.8	7.1	15.0	0.4		
Plymouth	97658	42.6	28.4	19.0	2.18	..	.50	.05	.13	.54	.08	.87	.42	183	9.2	56.1	6.0	11.5	0.3		
Bristol	232242	49.7	27.7	17.2	1.83	..	.24	.07	.15	.50	.20	.65	.63	148	8.7	71.5	8.9	20.6	0.9		
Cardiff	170063	28.1	31.1	14.9	2.19	..	.44	.10	.53	.20	.12	.79	.54	150	8.3	56.4	7.4	12.0	0.8		
Swansea	100309	19.7	29.3	15.8	1.36	..	.45	.10	.11	.42	.07	.21	.40	139	8.6	70.7	6.1	8.1	1.1		
Wolverhampton	87287	24.8	35.0	22.5	4.20	..	.53	.24	.62	.44	.27	2.11	.72	217	11.4	59.8	6.6	14.0	0.6		
Birmingham	505772	39.8	33.3	21.5	3.88	..	.79	.18	.29	.44	.18	1.97	.76	214	11.2	74.3	4.3	16.7	3.2		
Norwich	110154	14.6	30.5	18.7	2.22	..	.02	.10	.09	.43	.29	1.27	.50	196	7.7	66.4	6.3	13.3	1.4		
Leicester	203599	23.7	30.5	17.6	3.14	..	.07	.33	.36	.40	.19	1.76	.60	205	8.4	63.9	7.3	12.6	2.4		
Nottingham	232934	21.2	28.9	18.7	2.81	..	.20	.15	.09	.48	.21	1.65	.67	205	9.0	69.8	6.7	15.3	1.1		
Derby	103291	29.9	27.0	16.0	1.91	..	.16	.09	.09	.21	.25	1.09	.50	167	7.7	76.2	9.7	16.8	—		
Birkenhead	111249	31.9	31.6	18.2	2.45	..	.49	.20	.23	.28	.24	.98	.52	162	10.1	69.5	7.1	13.0	1.1		
Liverpool	633078	47.8	35.0	24.3	3.81	..	.53	.32	.19	.55	.26	1.93	1.09	200	14.0	79.0	6.7	22.1	3.4		
Bolton	121433	51.5	32.5	21.9	4.00	..	1.77	.18	.05	.34	.20	1.45	.69	186	12.5	85.9	8.2	9.7	0.1		
Manchester	534299	41.4	33.2	23.1	3.81	..	1.18	.23	.08	.56	.18	1.56	.80	194	13.4	84.2	7.1	21.0	1.2		
Salford	213190	41.2	35.0	23.9	5.50	..	2.22	.28	.15	.52	.31	2.00	.67	220	13.6	76.8	5.8	15.4	1.7		
Oldham	145845	30.8	26.0	19.2	2.60	..	.67	.13	.07	.53	.14	1.05	.47	183	11.2	77.1	5.7	11.2	0.2		
Burnley	106122	27.1	29.7	19.5	3.97	..	1.33	.04	.56	.59	.18	1.24	.55	219	10.5	70.4	4.9	7.7	1.4		
Blackburn	131330	18.8	27.7	19.5	3.45	..	1.11	.05	.06	.62	.29	1.31	.57	207	10.5	79.2	4.6	9.6	2.2		
Preston	115103	28.1	31.8	24.3	5.63	..	2.76	.04	.03	.26	.30	2.23	.54	263	12.3	81.3	3.2	8.0	3.4		
Huddersfield	101454	8.6	23.4	16.4	1.49	..	.26	.31	.20	.20	.15	.34	.52	130	9.7	71.0	4.3	10.3	2.6		
Halifax	95747	11.2	22.5	16.4	1.39	..	.50	.22	.09	.09	.16	.32	.56	139	9.0	75.2	5.4	13.6	2.4		
Bradford	231260	21.4	24.6	17.4	2.21	..	.34	.04	.06	.19	.13	1.43	.52	178	9.3	78.3	5.7	12.5	1.2		
Leeds	409472	19.0	31.6	19.8	2.79	..	.39	.23	.16	.23	.19	1.56	.65	191	10.4	79.9	7.8	10.6	0.6		
Sheffield	351848	17.9	34.4	21.2	3.48	..	.55	.25	.12	.40	.31	1.82	.56	197	11.0	82.4	4.2	13.4	2.8		
Hull	225045	27.4	33.3	18.5	3.26	..	.10	.27	.14	.24	.25	2.23	.71	178	9.2	67.8	7.4	14.3	1.7		
Sunderland	142107	43.1	34.6	19.7	2.56	..	.49	.07	.03	.54	.26	1.20	.68	163	10.0	74.0	6.9	14.1	1.0		
Gateshead	101070	32.2	35.5	18.2	2.32	..	.49	.17	.08	.31	.20	1.07	.36	173	9.4	68.1	6.1	7.9	0.6		
Newcastle	217555	40.5	31.3	19.1	2.08	..	.43	.09	.11	.28	.15	1.00	.91	177	10.6	72.1	8.7	17.5	0.8		

TABLE V.

Recorded & Corrected Death-rates—33 Great Towns, 1897.
(Registrar General's Returns.)

Towns in Order of their Corrected Death-Rate	Standard Death- Rate	Factor for Correction for Sex and Age Distribution	Recorded Average Death-Rate 1897	Corrected Death-Rate 1897	Comparative Mortality Figure 1897
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
England and Wales	19'15	1'0000	17'4	17'4	1000
33 Great Towns.....	17'71	1'0813	19'1	20'6	1183
Croydon	18'37	1'0424	13'1	13'6	781
Brighton	18'94	1'0110	15'1	15'2	873
Portsmouth.....	18'73	1'0224	16'2	16'5	948
Cardiff.....	17'16	1'1159	14'9	16'6	902
West Ham.....	17'75	1'0788	15'7	16'9	971
Swansea	17'53	1'0924	15'8	17'2	988
Derby	17'36	1'1031	16'0	17'6	1011
Bristol.....	18'33	1'0447	17'2	17'9	1028
Norwich	19'99	0'9579	18'8	18'0	1034
Halifax	17'20	1'1133	16'5	18'3	1051
Plymouth	19'70	0'9720	19'0	18'4	1057
Huddersfield	16'47	1'1627	16'4	19'0	1091
Leicester	17'64	1'0855	17'7	19'2	1103
London	17'97	1'0656	18'2	19'3	1109
Hull.....	18'23	1'0504	18'6	19'5	1120
Gateshead	17'83	1'0740	18'3	19'6	1126
Bradford.....	16'73	1'1446	17'5	20'0	1149
Birkenhead.....	17'42	1'0993	18'3	20'1	1155
Nottingham	17'81	1'0752	18'8	20'2	1160
Sunderland.....	18'25	1'0493	19'7	20'6	1183
Newcastle-on-Tyne.	17'58	1'0892	19'1	20'8	1195
Blackburn	17'05	1'1231	19'5	20'9	1201
Oldham	16'72	1'1453	19'2	21'9	1258
Leeds	17'28	1'1082	19'9	22'0	1264
Burnley	16'67	1'1487	19'5	22'3	1281
Sheffield	17'22	1'1120	21'2	23'5	1350
Wolverhampton.....	18'30	1'0464	22'5	23'5	1350
Birmingham	17'33	1'1050	21'6	23'8	1367
Bolton	16'90	1'1331	21'9	24'8	1425
Manchester.....	16'90	1'1331	23'1	26'1	1500
Preston	17'42	1'0993	24'4	26'8	1540
Salford	17'03	1'1244	23'9	26'8	1540
Liverpool	17'26	1'1094	24'4	27'0	1551

Crude or Recorded Death-Rate is the rate of mortality calculated from population and registered deaths without reference to sex or age.

Standard Death-Rate or Death-rate in Standard Population is the death-rate at all ages calculated on the assumption that the rates at each twelve age periods were the same as in England and Wales during 1881-90.

The Factor for Correction is the figures by which the crude death-rate should be multiplied in order to correct for age and sex distribution.

The Corrected Death-Rate is the crude death-rate multiplied by the factor for correction.

The Comparative Mortality Figure represents the comparison between the corrected death-rate for each town and that for England and Wales, which is taken as 1000.

Birth-rates and Death-rates in Wards from 1881-1897.

TABLE VI.

Year	Birth-Rate in Wards.								Death-Rate in Wards.											
	Borough	Exchange	Bradford	Derby	Rumworth	North	East	Church	Halliwell	West	Borough	Exchange	Bradford	Derby	Rumworth	North	East	Church	Halliwell	West
1881	36.1	31.0	35.9	38.0	35.3	36.6	34.8	30.5	40.2	37.6	19.1	24.6	19.6	19.8	21.0	13.3	20.9	19.7	18.9	16.4
1882	35.0	29.8	36.1	30.4	37.2	32.7	36.4	31.1	38.5	36.3	21.3	28.6	21.8	20.4	22.5	16.6	24.6	19.3	22.1	18.1
1883	34.2	29.3	35.6	36.9	37.8	31.8	33.4	29.7	35.3	34.8	19.9	28.4	19.6	21.4	18.1	17.6	23.4	16.2	17.3	17.4
1884	33.9	28.0	35.0	37.7	34.7	31.1	33.0	27.1	33.3	35.4	24.0	24.2	22.7	28.1	27.0	21.1	25.6	10.3	20.0	19.8
1885	34.4	25.5	33.2	41.0	32.0	28.3	32.8	34.3	36.3	34.8	20.7	20.1	19.7	25.9	18.4	15.0	21.0	18.5	16.8	16.5
1886	34.0	24.4	34.8	38.5	37.0	30.0	29.7	29.6	39.5	34.4	23.1	22.8	21.7	25.7	17.9	19.3	26.1	19.2	17.2	20.6
1887	32.3	26.7	31.9	35.0	36.2	32.7	32.9	25.8	35.0	31.4	21.2	22.1	19.6	25.7	18.2	15.9	19.4	17.8	19.1	19.6
1888	32.3	28.1	33.2	37.7	36.6	25.7	29.4	28.6	36.7	32.6	21.6	25.1	20.6	23.9	19.4	13.7	22.3	19.5	19.4	17.7
1889	32.7	24.6	34.9	36.1	38.4	27.8	32.1	28.2	36.9	31.5	22.0	21.5	21.6	25.3	21.8	17.7	22.8	17.7	22.0	17.7
1890	32.1	26.7	32.6	35.5	44.7	28.3	28.1	27.7	37.5	30.4	25.7	25.1	26.1	30.8	26.6	19.6	28.0	21.4	19.4	20.7
1881-1890	33.8	27.4	34.3	37.5	36.9	30.5	32.2	29.2	36.9	33.9	21.8	24.2	21.3	24.7	21.0	16.9	23.4	18.8	19.2	18.4
1891	33.9	31.3	35.0	36.6	40.1	30.9	35.0	26.2	35.2	32.4	21.8	32.2	19.1	25.0	16.6	14.8	20.5	19.8	17.9	18.5
1892	32.4	30.3	32.7	36.9	32.5	27.4	30.8	23.9	33.8	32.5	22.7	28.3	21.3	28.0	21.0	15.4	24.0	16.7	18.0	18.5
1893	33.0	30.6	35.5	34.9	35.3	29.2	35.2	22.1	33.6	32.1	23.9	30.0	23.7	27.0	24.0	19.4	26.1	12.9	19.4	21.6
1894	31.4	33.4	35.9	34.1	35.2	28.5	29.9	19.7	30.8	29.9	18.7	23.0	18.6	20.5	18.1	14.7	20.6	12.5	15.1	15.5
1895	33.1	34.0	33.7	35.6	38.1	26.6	35.3	19.5	35.2	33.4	23.9	24.6	24.7	29.9	23.0	16.5	24.7	15.7	22.0	21.0
1891-1895	32.7	31.9	34.5	35.6	36.2	28.5	33.6	22.2	33.7	32.0	22.2	27.6	21.4	26.0	20.5	16.1	23.1	15.5	18.4	19.0
1896	31.7	33.9	33.9	37.5	27.9	28.5	32.6	17.0	32.2	30.4	20.7	28.5	22.8	27.1	17.5	17.2	21.0	12.4	16.7	19.0
1897	32.8	31.3	31.3	35.6	29.5	31.6	30.9	20.7	37.4	31.5	21.9	26.3	23.2	20.8	19.6	19.5	27.7	17.1	21.9	20.1

Mortality in Age-groups.—The subjoined table shews the death-rates at various age-periods for Bolton for each year since 1891, for the 10 years 1881-90; also for England and Wales for the years 1881-90. We still maintain a high death-rate in ages above 35, and in those below 5. In the latter case it is especially high this year, on account of the large number of deaths due to measles, diarrhoea, and respiratory diseases.

TABLE VII.

**Death-rates per 1000 Persons living at certain
Age Periods.**

Age Periods	Popula- tion 1897	Death-Rate per 1000 of Population living at the respective Age Periods.							
		England and Wales	BOLTON						
		1881-90.	1881-90	1892	1893	1894	1895	1896	1897
All ages	121433	19'17	22'0	22'7	23'9	18'7	23'9	20'7	21'9
0 to 5	13747	56'77	72'37	78'7	89'8	61'9	94'9	68'94	85'5
5 to 10.....	13074	5'31	} 4'79	3'8	4'4	2'8	3'8	5'89	4'8
10 to 15	14440	3'04						2'38	2'7
15 to 20	13858	4'38	} 4'94	5'8	5'3	5'6	4'8	4'38	3'3
20 to 25	11986	5'64						5'12	5'8
25 to 35	19346	7'20	} 16'29	12'7	11'1	10'7	11'1	7'64	7'3
35 to 45	15183	11'51						14'56	13'5
45 to 55	10652	17'23	} 32'39	33'6	33'5	34'4	34'5	26'53	23'7
55 to 65	5595	31'57						49'23	47'5
65 to 75	2981	65'38	} 118'57	109'0	122'9	90'5	112'9	94'24	90'2
75 & upwards	571	213'60						191'63	236'4

Infantile Mortality.—There were 732 deaths of infants under 1 year of age (27·4 per cent. of the total deaths), as compared with 629 in 1896, making an infantile mortality of 184 per 1,000 births. There were 13 towns with a higher rate, ranging from Leeds 191, to Preston, 263, and the average for the 33 great towns was 176. (*See table IV.*)

The wards varied from 145 in Derby Ward to 246 in Exchange Ward. (*See table VI.*)

A comparison with 1896 shows that the increase is due entirely to deaths from measles, diarrhœa, and respiratory diseases.

DEATHS UNDER ONE YEAR.

	1896.	1897.
Measles	2	55
Whooping Cough	37	14
Diarrhœa	79	153
Enteritis	37	11
Convulsions	94	96
Premature Birth	70	69
Debility	81	81
Respiratory	95	136
	<hr/>	<hr/>
	495	615
Other causes... ..	135	117
	<hr/>	<hr/>
	629	732

Zymotic Mortality.—The deaths from the seven chief zymotic diseases numbered 506 as compared with 311 in 1896, giving a rate of 4·16 as compared with 2·6 in 1896, and 3·1 the average for the ten years 1887-1896. It compares unfavourably with the rate of the 33 great towns, which was 2·86, and Salford, Preston, and Wolverhampton were the only three with a higher rate.

There was a large increase in the deaths from measles and diarrhœa, and the rates for these were above the average for the previous 10 years; on the other hand, small-pox, scarlet fever, diphtheria, whooping cough, and enteric fever were all below the average, that for diphtheria being the lowest on record.

In Table IV. Bolton is compared with other great towns, and in Table VIII. with previous years.

TOTAL DEATHS FROM ZYMOTIC DISEASES.

	1896.	1897.
Seven Chief Zymotics. { Small-pox	0	0
{ Scarlet Fever	39	23
{ Diphtheria... ..	12	4
{ Enteric Fever	50	24
{ Measles... ..	6	216
{ Whooping Cough	100	40
{ Diarrhœa	103	199
{ Influenza	17	40
{ Other Zymotics	27	20
	<hr/>	<hr/>
	354	566

**Death-rate from Seven Chief Zymotic Diseases,
1886-1897.**

TABLE VIII.

	Small- pox	Measles	Scarlet Fever	Diph- theria	Whooping Cough	Fever	Diarrhoea	Seven Chief Zymotics
1886	—	1'23	'14	'06	'67	'16	1'39	4'4
1887	—	'80	'32	'06	'24	'31	1'29	3'06
1888	—	'29	'45	'06	'50	'33	'99	2'6
1889	—	1'39	'56	'25	'55	'27	'91	4'1
1890	—	'83	'48	'12	'92	'22	'94	3'53
1891	—	'47	'18	'08	'38	'27	'81	2'22
1892	—	'36	'25	'11	'92	'17	1'10	2'95
1893	'05	1'38	'28	'06	'66	'28	1'67	4'42
1894	—	'16	'08	'04	'51	'21	'57	1'59
1895	—	1'00	'17	'12	'56	'41	1'74	4'03
1896	—	'04	'32	'07	'83	'41	'85	2'5
Bolton, 1887-96	'005	'67	'30	'09	'60	'28	1'08	3'10
1897	—	1'77	'18	'03	'32	'19	1'63	4'16
Average, 33 Great Towns, 1887-1896 }	—	'59	'25	'30	'52	'19	'85	2'70
33 Great Towns, 1897	—	'55	'18	'31	'40	'17	1'24	2'86

Classification of the Causes of Deaths.—The 2,671 deaths from all causes are conveniently divided into seven groups—

1. Zymotic Diseases 566 or 21'2 per cent. total deaths.
2. Dietetic „ 8 or '2 „
3. Constitutional „ 370 or 13'8 „
4. Developmental „ 250 or 9'3 „
5. Local „ 1277 or 47'7 „
6. Violence „ 79 or 2'9 „
7. Ill-defined „ 121 or 4'5 „

In the zymotic group the percentage is a high one, and the cause of it has already been referred to. In the other groups there is very little difference from 1896 and the average of previous years.

An abstract of the larger table and a comparison with 1896 is given here.

Summary of Causes of Deaths.

				Deaths.	
				1896.	1897.
I. Specific Febrile or Zymotic Diseases—					
1.	Ordinary Zymotic Diseases	...	...	227	348
2.	Diarrhoea ...	...	...	103	199
3.	Malarial ...	...	...	1	0
4.	Zoogenous	...	...	0	0
5.	Venereal ...	...	...	10	7
6.	Septic ...	...	...	13	12
II. Parasitic Diseases 1 ... 0					
III. Dietetic Diseases 13 ... 8					
IV. Constitutional Diseases ... 365 ... 370					
V. Developmental Diseases ... 228 ... 250					
VI. Local Diseases—					
1.	Nervous System	...	...	309	306
2.	Special Sense Organs	...	...	1	4
3.	Circulatory System	...	...	153	163
4.	Respiratory	...	...	588	559
5.	Digestive ...	...	...	169	157
6.	Lymphatic	...	...	7	2
7.	Urinary System	...	...	73	49
8.	Reproductive System—				
	(A) Generative Organs	...	...	3	3
	(B) Parturition	...	...	18	21
9.	Bones and Joints...	...	...	4	6
10.	Integumentary	...	...	6	7
VII. Violence—					
1.	Accidents...	...	...	53	61
2.	Homicide	...	...	1	1
3.	Suicide	...	...	14	17
VIII. Ill-defined and non-specified 132 ... 121					
Total ...				2492	2671

TABLE IX.
CAUSES OF DEATH.

[illegible]

DISEASES.	Total	M.	F.	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80	80 to 85	85 and upwards	0 to 5	5 and upwards
6.—SEPTIC DISEASES.																											
Puerperal Fever...	6	...	6	...	...	...	...	...	...	...	...	3	1	2	...	...	1	...	...	...	...	...	...	...	...	...	6
Erysipelas	4	1	3	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	3
Pyæmia, Septicæmia	2	1	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Phagedæna	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
II.—Parasitic Diseases.																											
Thrush	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Diseases from Vegetable Parasites	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydatid Disease	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Worms	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Diseases from Animal Parasites	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
III.—Dietetic Diseases																											
Starvation, want of Breast Milk	3	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Scurvy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intemperance (Chronic Alcoholism.	5	2	3	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...
Delirium Tremens..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Plumbism	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
IV.—Constitutional Diseases.																											
Phthisis	186	108	78	...	...	...	...	...	2	4	15	26	22	21	23	26	23	15	3	1	3	1	1	...	...	...	186
Tabes Mesenterica	19	10	9	10	5	...	...	...	...	1	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	15
Tubercular Meningitis	9	3	6	4	1	1	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
Acute Hydrocephalus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Other forms of Tuberculosis, Scrophula.	37	20	17	3	3	4	1	4	2	1	2	2	3	2	4	1	4	...	...	1	1	...	...	...	...	...	15
Rheumatic Fever, Rheumatism of Heart	4	3	1	...	...	...	...	...	2	2	...	...	2	2	3	1	1	1	...	...	...	1	1	...	...	...	4
Rheumatism	14	7	7	...	...	...	...	...	1	1	2	...	2	2	3	1	...	1	...	...	...	...	...	...	...	...	14
Gout	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rickets	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Cancer and Malignant Disease	83	33	50	...	...	...	...	1	...	...	...	...	...	1	3	7	13	11	11	14	15	7	...	...	...	...	1
Purpura and Hæmorrhagic Diathesis.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Anæmia Chlorosis Leucocythæmia	8	1	7	...	1	...	...	...	...	...	...	...	1	1	1	1	1	...	...	...	1	2	...	...	...	...	1
Diabetes Mellitus	9	5	4	...	...	...	...	...	...	...	...	...	...	...	1	1	1	...	2	1	1	1	1	...	...	...	9
Other Constitutional Diseases..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total Constitutional...	370	191	179	17	11	5	3	5	4	9	20	30	28	28	35	37	42	28	16	16	21	12	3	...	...	41	329

DISEASES.	Total.	M.	F.	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80	80 to 85	85 and upwards	0 to 5	5 and upwards
V.—Developmental Diseases																											
Premature Birth	69	35	34	69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	69	...
Atelectasis	3	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...
Cyanosis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spina Bifida	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Imperforate Anus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate, Hare Lip...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Congenital Defects	5	1	4	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
Old Age	173	69	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	173
Total Developmental	250	107	143	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	77	173
VI.—Local Diseases.—																											
I.—DISEASES OF NERVOUS SYSTEM.																											
Apoplexy	87	36	51	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	87
Hemiplegia, Brain Paralysis	12	4	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
Softening of Brain	7	2	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
Inflammation of Brain and its Membranes	47	28	19	17	8	2	2	2	6	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47
Paralysis Agitans	5	2	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
Insanity, General Paralysis of Insane...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Chorea	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Epilepsy	11	7	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
Convulsions	112	66	46	96	11	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	112
Laryngismus Stridulus...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Idiopathic Tetanus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sunstroke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paraplegia, Disease of Spinal Cord	8	5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
Other Diseases of Nervous System	12	9	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
Total Nervous System...	306	161	145	114	20	7	3	2	10	4	2	3	3	3	6	7	11	18	15	23	23	17	13	2	...	146	160

DISEASES.	Total.	M.	F.	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80	80 to 85	85 and upwards	0 to 5	5 and upwards
2.—DISEASES OF ORGANS OF SPECIAL SENSE.																											
Otitis, Otorrhœa ...	4	2	2	...	1	1	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
Epistaxis and Disease of Nose ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ophthalmia and Disease of Eyes ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.—DISEASES OF CIRCULATORY SYSTEM.																											
Endocarditis, Valvular Disease of Heart ...	142	53	89	7	...	1	...	...	1	7	3	10	7	6	6	7	15	10	23	14	7	14	2	2	...	8	134
Pericarditis ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hypertrophy of Heart ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	2
Angina Pectoris ...	9	4	5	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	1	2	2	1	...	...	...	...	9
Syncope ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	1
Aneurism ...	5	3	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	2	2	...	...	...	...	5
Senile Gangrene ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Embolism, Thrombosis ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phlebitis ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Varicose Veins ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Other Diseases of Circulatory System ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	2
Total Circulatory System ...	167	68	99	7	1	2	...	...	2	7	4	10	7	6	7	10	15	13	25	16	12	18	2	3	...	10	157
4.—DISEASES OF RESPIRATORY SYSTEM.																											
Bronchitis ...	335	172	163	105	37	7	3	3	3	2	1	2	1	4	6	13	16	23	23	28	22	16	16	1	3	155	180
Pneumonia ...	160	109	51	20	24	9	1	2	9	...	4	5	8	3	6	13	13	11	9	9	6	6	2	...	...	56	104
Pleurisy ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	...	2
Emphysema and Asthma ...	7	4	3	...	2	...	...	...	1	...	...	1	...	...	...	...	1	1	1	1	...	...	...	...	...	2	5
Laryngitis ...	6	...	6	1	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2
Group ...	18	10	8	3	4	3	5	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	1
Other Diseases of Larynx and Trachea ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Diseases of Respiratory System ...	31	15	16	7	2	1	3	2	1	...	...	1	...	1	2	3	1	1	2	1	2	...	1	...	...	15	16
Total Diseases of Respiratory System ...	559	310	249	136	70	20	13	10	17	2	5	9	9	8	14	29	31	36	35	39	30	23	19	1	3	249	310

DISEASES.	Total.	M.	F.	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	85 and upwards	0	5	5 and upwards
				to 1	to 2	to 3	to 4	to 5	to 10	to 15	to 20	to 25	to 30	to 35	to 40	to 45	to 50	to 55	to 60	to 65	to 70	to 75	to 80	to 85	to 85	to 85	to 5	to 5	to 5
10.—DISEASES OF ORGANS OF LOCOMOTION.																													
Caries, Necrosis...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...
Arthritis, Ostitis, Periostitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Other Diseases of Organs of Locomotion	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
11.—DISEASES OF INTEGUMENTARY SYSTEM.																													
Carbuncle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phlegmon, Cellulitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Eczema	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lupus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcer, Bed sore	4	1	3	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Pemphigus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Diseases of Integumentary System	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
VII.—Violence.																													
I.—ACCIDENTS AND NEGLIGENCE.																													
Fractures and Contusions	...	23	4	2	...	1	...	...	3	2	2	4	2	1	1	1	1	3	...	1	2	...	...	1	...	...	3	...	...
Gunshot Wounds	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cut, Stab	...	...	...	...	...	2	3	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	...	...
Burn, Scald	15	8	7	2	2	2	3	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...
Poison	2	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...
Drowning	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Suffocation	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Otherwise	15	10	5	...	...	...	...	1	1	...	...	...	3	3	...	...	1	...	1	1	2	...	2	...	...	...	1	...	...
Total Accidents or Negligence	61	44	17	5	2	3	3	4	6	3	3	4	6	5	1	1	2	3	1	2	4	...	2	1	...	...	17	...	...
2.—HOMICIDE.																													
Murder	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Manslaughter	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE X.
METEOROLOGICAL OBSERVATIONS.

1897	Baro- meter	Readings of Thermometers					Elastic Force of the Aqueous Vapour	Mean Amount of Humidity. Saturation, per 100°	Mean Amount of Clouds	Rain	Registered Sunshine in Hours	Mean Amount of Ozone 0 - 10 to - Maximum
	Corrected and Reduced to 32° Far. Mean sea level	Highest	Lowest	Mean	Range	Dew-point				Amount Collected		
											h. m.	
January	29.933	38.3	30.8	34.80	7.5	31.0	0.177	89.8	7.0	1.964	26-25	.02
February.....	30.053	44.7	37.3	40.74	7.4	37.5	0.229	90.4	7.2	3.711	22-40	1.00
March	29.588	47.3	38.1	42.70	9.2	37.3	0.228	85.0	9.2	3.443	69-30	1.68
April	29.847	49.8	38.0	42.69	11.8	36.8	0.244	77.8	7.3	3.061	114-10	1.10
May.....	29.970	57.0	41.7	48.09	15.3	40.5	0.256	70.5	6.3	2.255	228-45	1.00
June.....	29.999	64.6	51.1	56.24	13.5	51.0	0.382	79.4	8.3	4.823	107-0	.73
July	30.005	67.6	52.8	58.83	14.8	51.6	0.393	73.5	6.0	1.462	207-5	1.20
August	29.773	66.9	52.2	58.41	14.7	52.8	0.403	77.0	7.2	4.866	135-15	.90
September ...	29.960	53.8	46.4	52.02	12.4	47.1	0.325	80.0	7.2	5.006	92-50	.80
October	30.153	56.0	44.2	49.21	11.8	44.0	0.292	82.3	7.1	2.414	63-35	.45
November ...	30.175	50.7	41.1	47.06	9.3	42.0	0.274	88.0	8.2	4.681	19-50	.37
December ...	29.844	45.1	35.4	40.40	9.7	36.4	0.221	88.5	9.1	5.009	16-25	.81
Mean	29.942	53.9	42.4	47.60	11.4	42.3	.284	81.8	7.5	42.695	1103-30	.84

INFECTIOUS DISEASES.

Notification.—796 cases were notified, as compared with 1,042 in 1896, and 971 as an average for the 10 years 1887-1896, the rate per 1,000 inhabitants being 6·5. The average weekly notifications were 15·3, the highest being 38 in the 40th week, and the lowest one in the 19th week.

Of these, 645 scarlet fever and 125 enteric fever were below the average for the last 10 years, and 8 puerperal slightly above the average; 17 diphtheria were not only much below the average, but the lowest number notified in any year during the last 10 years.

Scarlet fever was most prevalent in August, September, and October, 274 cases occurring within three months; enteric in months from August to December. The wards with the highest rates were—North, 10·0; West, 8·2; and Halliwell, 7·3.

Enteric Fever.—The 125 cases gave a case-rate of 1·02 per 1,000; the 24 deaths a death-rate per 1,000 of population of ·20; and a death-rate per cent. of cases of 19·2—all below the average for the last 10 years.

The distribution was fairly even in the different wards, the highest being East with a case-rate of 1·5 per 1,000, and the lowest North, ·4.

The incidence in respect to the form of closet was—

1	case in every	166	houses with	privy-ashpits.
1	„	189	„	pail-closets.
1	„	236	„	waste-water closets.
1	„	299	„	“Gowanlocks.”
1	„	709	„	fresh-water closets.

TABLE XI.

**Weekly Notifications of Scarlet and Enteric Fever,
1897.**

Week.	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
	Scarlet Fever	Enteric	Scarlet Fever	Enteric	Scarlet Fever	Enteric	Scarlet Fever	Enteric
1st	20	2	4	2	10	2	36	2
2nd	8	1	1	2	12	1	19	9
3rd	7	2	2	—	13	4	21	—
4th	12	1	4	—	10	1	21	2
5th	4	4	7	4	20	1	16	1
6th	14	4	1	—	15	1	16	8
7th	19	—	6	2	13	2	12	2
8th	5	7	12	3	22	8	12	1
9th	10	1	6	—	17	4	22	3
10th	6	—	8	1	32	1	11	—
11th	6	2	10	1	20	2	17	4
12th	11	3	7	1	22	7	12	9
13th	4	1	7	2	21	1	12	3
Total ...	116	28	75	18	227	35	227	44

TABLE XII.

Ward Distribution of Notified Diseases, 1897.

Ward	Small-pox	Scarlet Fever	Enteric Fever	Diphtheria	Puerperal Fever	Relapsing Fever	Total	Rate per 1000	Admitted to Hospital	
									Small-pox	Scarlet Fever
Exchange	25	4	2	1	...	32	4'4	...	14
Bradford	118	14	...	3	...	135	7'1	...	51
Derby	40	20	1	...	...	61	3'3	...	9
Runworth	7	4	...	1	...	12	2'0	...	...
North	63	3	4	...	...	70	10'0	...	19
East	60	17	2	...	1	80	7'0	...	30
Church	52	12	..	1	...	65	6'7	...	21
Halliwell	98	18	...	1	...	117	7'3	...	39
West	182	33	8	1	...	224	8'2	...	78
Borough	645	125	17	8	1	796	6'5	...	261

TABLE XIII.

Infectious Diseases Notified from 1886 to 1897.

Year	Small-pox	Scarlet Fever	Diphtheria	Enteric Fever	Continued Fever	Typus Fever	Asiatic Ch'lera	Puerperal Fever	Relapsing Fever	Total	Rate per 1000 of populat'n	Average Weekly Numbers
1886...	...	322	18	60	..	3	...	3	...	406	3'5	7'8
1887...	...	721	22	107	2	2	...	...	...	854	7'6	16'4
1888...	11	924	51	180	...	2	...	4	...	1172	10'3	22'5
1889...	4	1256	92	125	2	16	...	...	...	1495	13'0	28'7
1890...	...	1071	74	101	1	15	...	4	...	1266	10'9	24'3
1891...	...	411	93	145	...	16	...	5	...	670	5'8	12'8
1892...	1	683	112	97	1	2	1	8	...	905	7'7	17'3
1893...	44	747	123	170	...	2	...	4	...	1090	9'2	20'9
1894...	2	267	25	117	1	...	...	16	...	428	3'6	8'2
1895...	10	495	34	237	1	...	...	7	...	784	6'5	15'0
1896...	1	816	29	186	...	...	...	10	...	1042	8'6	20'0
1887 to 1896)	7'3	739'1	66'5	146'5	·8	5'5	·1	5'8	...	970'6	8'3	18'6
1897...	...	645	17	125	...	...	...	8	1	796	6'5	15'3

TABLE XIV.
Enteric Fever in Bolton 1881-1897.

Year	Cases	Case-rate per 1000 of Population	Deaths	Death-rate per 1000 of Population	Death-rate per cent. of Cases
1881	98	'92	19	'18	19'3
1882	77	'72	17	'15	22'0
1883	75	'69	17	'15	22'6
1884	152	1'39	26	'3	17'1
1885	57	'51	17	'15	29'8
1886	60	'53	12	'10	20'0
1887	107	'95	31	'27	28'9
1888	180	1'58	31	'27	17'2
1889	125	1'09	31	'27	24'8
1890	102	'88	22	'18	21'5
Av. 1881-90	103	'92	22	'19	22'3
1891	145	1'24	30	'26	20'6
1892	97	'83	19	'16	19'5
1893	170	1'44	34	'28	20'0
1894	117	'98	25	'20	21'3
1895	237	1'98	50	'41	21'0
Av. 1891-95	153	1'29	31	'26	20'4
1896	186	1'54	50	'41	26'8
1897	125	1'02	24	'20	19'2

TABLE XV.

Cases of Enteric Fever Reported in each Month during
the last 5 years compared with 1897.

MONTH	1892	1893	1894	1895	1896	Av.	1897
January	7	22	12	14	24	15·8	6
February.....	4	16	9	19	15	12·6	15
March	3	6	11	14	15	9·8	7
April	7	9	6	8	19	9·8	4
May	5	4	8	4	12	6·6	9
June.....	6	9	5	2	7	5·8	5
July	3	20	6	19	9	11·4	8
August	7	18	7	21	21	14·8	15
September	3	22	12	28	17	16·4	12
October	16	13	11	44	19	20·6	13
November	14	20	16	31	13	18·8	13
December	22	11	14	33	15	19·0	18
Total.....	97	170	117	237	186	161·4	125

TABLE XVI.
Enteric Fever in Wards 1897.

Wards	Population	No. of Cases	Case-rate per 1000 of the Population	Pail	Midden	Gowanlock	Waste Water Closets	Fresh Water Closets
Exchange	7252	4	'5	...	4	..	...	...
Bradford	18952	14	'7	5	7	...	1	1
Derby	18302	20	1'0	6	9	...	5	...
Rumworth	5759	4	'6	1	1	1	1	...
North	6943	3	'4	1	...	...	2	...
East	11313	17	1'5	8	6	2	1	...
Church	9665	12	1'2	2	8	1	...	1
Halliwell.....	16022	18	1'1	4	11	...	3	...
West	27225	33	1'2	9	20	2	1	1 and midden
Borough ...	121433	125	1'02	36	66	6	14	3

SECOND CASES.

Bradford .....	...	...	...	...	1	...	...	...
Derby .....	...	...	...	1	1	...	...	...
North .....	...	...	...	...	...	...	1	...
East.....	...	...	...	...	..	1	...	...
Church .....	...	...	...	...	1	...	...	...
West .....	...	...	...	...	4	...	...	...
Total .....	...	...	...	1	7	1	1	...

THIRD CASES.

Derby .....	...	...	...	...	...	...	1	...
East.....	...	...	...	1	1	...	...	...
Halliwell.....	...	...	...	...	1	...	...	...
Total .....	...	...	...	1	2	...	1	...

TABLE XVII.

**Monthly Cases of Enteric Fever, 1897, in respect
to Closet Accommodation.**

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Midden	3	11	2	3	6	2	4	10	3	5	9	8	66
Gowanlock	1	...	...	...	1	...	...	...	3	1	...	...	6
Pail	1	4	4	1	1	2	3	2	6	4	3	5	36
Waste Water Closets	...	...	1	...	1	1	1	1	...	3	1	5	14
Fresh Water Closets	1	...	...	...	...	...	...	2	...	...	...	...	3
Total	6	15	7	4	9	5	8	15	12	13	13	18	125

Measles.—This is not a notifiable disease, and therefore the only way to judge of the number of cases is from the deaths, which numbered **216**. Reckoning these as about 5 per cent. of the cases would mean over 4,000. This is the largest number of deaths for 10 years in Bolton, and the highest death-rate. In 1896 there were only 6 deaths.

Bolton compares unfavourably with the 33 great towns, and Lancashire towns have especially suffered.

Measles.

Towns.	Death-rate per 1,000
Blackburn	1·11
Manchester	1·18
Burnley	1·33
Bolton	1·77
Salford	2·22
Preston	2·76
33 Towns	·55

Deaths were registered from the 3rd week in January to the 4th week in July, but the epidemic really extended from March 7th to May 8th, during which time 133 out of the 216 deaths occurred. It began in East, West, and Halliwell, and later on extended to Bradford and Derby Wards. Reckoning the total number of deaths from measles in each ward during the year, the rate per 1,000 was about the same, except in Rumworth and Church, which were lower than the others.

The usual precautions were taken. Every house in which a death occurred was visited by the Sanitary Inspector and disinfected. Handbills were distributed, and insanitary conditions remedied. The School Authorities were advised not to allow children to go to school from houses

where the disease existed, and the Head Teachers of the various schools kindly supplied me with a weekly list of absentees. When the numbers rose to 20 per cent. I recommended the Sanitary Committee to order the closure of the school, which was then disinfected, cleansed, and in many cases whitewashed. The tables following give various details concerning the epidemic.

TABLE XVIII.

Deaths from Measles, 1887—1897.

Month	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1887 to 1896	1897
Janunry .....	...	16	18	...	23	...	26	...	8	1	9·2	3
February.....	...	2	5	1	5	...	56	...	12	...	8·1	23
March .....	...	1	37	...	9	1	43	1	22	...	11·4	55
April .....	...	2	33	1	10	...	24	...	27	...	9·7	66
May.....	...	3	34	...	1	1	6	...	30	1	7·6	31
June.....	3	...	13	2	2	1	2	...	14	2	3·9	30
July	5	...	9	2	1	...	2	...	2	...	2·1	8
August	11	...	3	3	...	...	3	...	3	1	2·4	...
September	6	...	2	2	...	...	...	...	2	..	1·2	...
October	27	...	1	12	2	6	...	2	...	...	5·0	...
November	18	2	2	27	2	6	...	7	...	1	6·5	...
December	21	8	3	47	..	23	...	10	...	..	10·9	...
Year	91	34	160	97	55	43	162	20	120	6	78·8	216

TABLE XIX.

**Deaths from Measles in Wards and Age-periods
with rate per 1000 of Population, 1897.**

Wards	Total Deaths		Under 12 months	1 to 2	2 to 3	3 and upwards
	No.	Rate per 1000				
Exchange	16	2'2	6	7	2	1
Bradford	25	1'3	7	9	4	5
Derby	29	1'5	6	14	3	6
Rumworth	2	0'3	1	1	...	..
North	13	1'8	2	9	1	1
East	29	2'5	10	12	5	2
Church	7	0'7	2	2	...	3
Halliwell	33	2'0	8	19	3	3
West	62	2'2	16	26	11	9
Borough	216	1'7	58	99	29	30

TABLE XX.

Weekly Deaths from Measles 1897.

Wards	Jan.		February			March			April			May			June			July			Total										
	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5		12	19	26	3	10	17	24	31		
Exchange	1	...	...	1	2	1	1	...	...	...	2	1	2	...	...	1	1	...	...	...	...	...	2	...	1	...	16	
Bradford	1	...	1	...	...	...	...	...	...	...	1	...	2	1	1	2	1	3	* 1	5	2	3	...	1	...	...	...	...	...	25	
Derby	1	...	...	1	...	1	1	1	2	2	2	5	...	...	3	...	3	2	2	1	...	1	...	1	...	29	
Rumworth	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	
North	2	1	2	2	...	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	
East	...	2	...	2	3	1	1	1	6	2	...	2	1	3	1	1	1	...	1	...	...	...	1	...	...	...	...	...	...	...	29
Church	1	...	...	...	1	2	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	7
Halliwell	1	...	...	1	7	1	3	2	2	2	4	3	2	...	...	1	1	1	...	...	...	...	1	1	...	...	...	33
West	3	3	4	2	1	4	6	7	4	8	3	5	2	2	...	1	1	...	2	2	1	...	...	...	1	...	...	62
Borough	1	2	1	6	7	6	6	14	13	15	14	11	20	17	15	14	4	3	8	8	8	7	8	5	3	3	2	2	1	...	216

TABLE XXI.

Measles and School Closure 1897.

Week ending	Deaths	School	Time Closed
Jan. 23	1		
30	2		
Feb. 6	1		
13	6		
20	7		
27	6		
Mar. 6	6		
13	14		
20	13		
27	15		
		St. Matthew's ...	29th March-20th April
		St. Thomas's ...	31st March-10th May
		St. Joseph's ...	31st March-10th May
		Halliwell Road Wesleyan ...	1st April-3rd May
		St. James's ...	2nd April-26th April
		Gaskell Street Board ...	1st April-26th April
April 3	14		
		St. William's ...	7th April-3rd May
		SS. Peter and Paul ...	7th April-3rd May
		St. Mary's ...	9th April-10th May
10	11		
		Haulgh Board ...	13th April-3rd May
		St. Paul's, Halliwell ...	13th April-5th May
		Easter Vacation from	15th April-20th April
17	20		
		Clarendon Street Board ...	23rd April-17th May
		Folds Road Board ...	23rd April-17th May
		All Saints' ...	23rd April-17th May

Week ending	Deaths	School	Time Closed
April 24	17	Ridgway Endowed Pikes Lane Board	... 30th April-4th May ... 30th April-24th May
May 1	15		
8	14		
		St. Mark's ...	... 11th May-24th May
15	4		
22	3		
29	8		
		Emmanuel ...	... 31st May-23rd June
June 5	8		
		St. Luke's ...	... 7th June-28th June
12	7		
19	8		
26	5		
July 3	3		
10	3		
17	2		
24	2		
31	1		



Diphtheria.—Only 17 cases were notified during the year, with 4 deaths. One of the deaths was that of a patient admitted to the Infirmary from Great Lever, outside the Borough, so that the Borough is responsible for 16 cases with 3 deaths. This is one of the lowest numbers notified in the Borough, and places Bolton amongst the three large towns with lowest diphtheria death-rate for 1897.

Diarrhœa.—The deaths from this disease, which is not a notifiable one, were 199 compared with 103 in 1896, and above the average for the last 10 years. It was prevalent from July 31st till September 25th, during which time the average weekly 4ft. temperature was at or above 57° Fahrenheit. All houses where the deaths occurred were visited by the Inspectors, obvious nuisances abated, and disinfectants supplied where necessary.

DEATHS FROM SUMMER DIARRHŒA DURING AUGUST AND SEPTEMBER.

Week ending.	Av. 4ft. Temp.	Number of Deaths.
July 31	57° F.	6
Aug. 7	58° F.	9
„ 14	59° F.	24
„ 21	58° F.	40
„ 28	57° F.	16
Sept. 4	57° F.	22
„ 11	55° F.	15
„ 18	54° F.	10
„ 25	53° F.	7
Oct. 2	52° F.	3

Hospital Isolation.—261 or 40 per cent., of the cases of scarlet fever notified were isolated at the Borough Fever Hospital, Rumworth, as compared with 292 cases in 1896. There were three deaths, making a death-rate of 1·1. The highest number admitted in any one month was 38, and the largest number remaining at any time 42. The average stay at hospital was 50 days.

Unfortunately, cases of scarlet fever are not evenly distributed throughout the year, so that at times not more than half the applications for admission could be granted. There was no room for other infectious diseases, such as enteric fever, diphtheria, &c., as throughout the year the 20 beds for females or the 20 beds for males were always occupied.

The staff now consists of a matron, a staff nurse, three probationers, four servants, a gardener, and a porter; the nursing staff having been reduced by two from the previous year. The present matron is also charge nurse, and there is one probationer less. At times the work has been very hard, and there has been the usual amount of sickness amongst the staff. The harmony existing among them, and the knowledge that the Committee are desirous of making things as comfortable as possible, have caused them to think lightly of these difficulties. Few people appreciate how much the recovery of the patients depends upon good nursing and sympathetic care, and I am pleased to be able to say that in this respect the staff has done everything that could be desired.

The Hospital is thoroughly appreciated by the inhabitants, and there will be an ever-increasing demand for admission, for, in spite of the fact that most of those admitted are children of tender years, the parents are generally very willing to send them to the Hospital, and are always profuse in their thanks for everything that is done for them.

The outside of the pavilions, administrative block, out-buildings, and walls have been painted during the year.

Plans have been passed by the Council for the extension of the Hospital by the erection of a new pavilion for 38 beds, an enlargement of the administrative block by 9 new bedrooms, a committee room, and new nurses' day-room, increasing the size of the laundry, and the erection of a porter's lodge and suite of discharging rooms. This will make the total accommodation at the Hospital 78 beds, not reckoning the 12 beds in the Small-pox Hospital. The Bolton Tramways and Improvement Act, 1897, gave the Committee power to borrow £6,000 for this purpose.

TABLE XXII.

Admissions to Hospital.—1897.

	Scarlet Fever.				Total.	
	Males.		Females.			
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Under 1	...	...	1	...	1	...
1 to 2	1	...	1	...	2	...
2 to 3	10	...	7	...	17	...
3 to 4	9	1	10	1	19	2
4 to 5	19	1	14	...	33	1
5 to 10	56	...	76	...	132	...
10 to 15	16	...	16	...	32	...
15 to 20	6	...	12	...	18	...
20 to 25	1	...	4	...	5	...
25 to 30	...	...	1	...	1	...
30 to 35	...	...	1	...	1	...
35 to 40	...	...	...	...	...	...
40 to 45	...	...	...	...	...	...
And upwards.	...	...	...	...	...	...
Total.	118	2	143	1	261	3

Comparison of Cases of Scarlet Fever Treated at Home and in the Borough Hospital.

Year	Cases Notified.	Admitted to Hospital.	Per Centage Admitted to Hospital.	Cases Treated at Home.	Cases Treated at Hospital.	Died at Home.	Died at Hospital.	Death-Rate per cent. of Home Cases.	Death-Rate per cent. of Hospital Cases.
1884.....	303	35	11.5	268	35	15	1	5.5	2.8
1885.....	186	89	47.8	97	89	9	2	9.2	2.2
1886.....	322	193	59.9	129	193	16	2	12.4	1.0
1887.....	721	292	40.4	429	292	37	6	8.6	2.0
1888.....	924	279	30.1	645	279	52	4	8.0	1.4
1889.....	1256	292	23.2	964	292	65	4	6.7	1.3
1890.....	1071	267	24.9	804	267	56	7	6.9	2.6
1891.....	411	111	27.0	300	111	21	0	7.0	0.0
1892.....	683	156	22.8	527	156	30	3	5.6	1.9
1893.....	747	160	21.4	587	160	34	1	5.7	0.6
1894.....	267	132	49.4	135	132	10	4	7.4	3.0
1895.....	495	154	31.1	341	154	20	2	5.8	1.2
1896.....	816	292	35.7	524	292	32	7	6.1	2.3
1897.....	645	261	40.4	384	261	20	3	5.2	1.1
Total	8847	2713	30.6	6134	2713	417	46	6.7	1.6

SUMMARY OF SANITARY WORK, 1897.

1.—Complaints from Public	...	...	...	...	152
2.—Ashpit Applications	...	...	...	...	4410
3.—General Inspections	...	...	...	...	30940
Houses	...	...	...	...	14999
Newly-infected Houses	...	...	...	...	1168
Factories and Workshops	...	...	...	...	953
Offensive Trades	...	...	...	...	51
Dairies, Cowsheds, Milkshops, &c.	...	...	...	...	1330
Slaughterhouses, Cattle Sidings, &c.	...	...	...	...	5333
Canal Boats	...	...	...	...	26
Miscellaneous	...	...	...	...	535
Special Privy Inspections	...	...	...	...	6745
4.—Smoke :					
Observations	...	...	...	...	381
Nuisances Reported	...	...	...	...	64
Notices Served	...	...	...	...	21
Prosecutions	...	...	...	...	22
Convictions	...	...	...	...	17
Total Fines	...	...	...	...	£6 5s.
5.—Nuisances Reported	...	...	...	...	2803
Dirty Houses	...	...	...	...	380
Overcrowded Houses	...	...	...	...	20
Workshops requiring Limewashing	...	...	...	...	44
Defective Eaves-gutters and Down-spouts	...	...	...	...	288
Defective Drains	...	...	...	...	261
Slop-pipes Connected	...	...	...	...	39
Drains Choked	...	...	...	...	578
Insufficient Closets	...	...	...	...	66
Closets in Bad Repair	...	...	...	...	603
Yards in Bad Repair	...	...	...	...	182
Offensive Accumulations	}	..	...	...	342
Fowls kept as a Nuisance					
Houses in Bad Repair					
6.—Action Taken :					
Letters Written or Verbal Notices	...	...	...	...	901
Informal Notices Issued	...	...	...	...	1510
Legal Notices Issued	...	...	...	...	1010
7.—Houses Disinfected :					
Fumigated...	...	...	...	...	1761
Bedding and Clothing Stoved	...	...	...	...	7204
Do. do. Destroyed	...	...	...	...	198
Schools Disinfected	...	...	...	...	27

8.—Limewashed :

Dwelling-houses, Lodging-houses, and Cellars...	375
Yards and Passages	5
Bakehouses and Factories	34
Slaughter-houses, Dairies, &c.	348

9.—Overcrowding Abated 16**10.—Accumulations Removed :**

Manure and Refuse	140
Stagnant Water or Minor Nuisances	329

11.—Passages and Yards :

Flagged	25
Repaired	185
Drained	7
Cleansed or Obstructions Removed	123

12.—Ashpits and Pails :

Converted	16
New provided	8
Repaired and Cleansed	41

13.—Water Closets :

New provided	75
Reconstructed	35
Repaired and Cleansed	182

14.—Urinals Provided 2**15.—Drains :**

Tested by Smoke Machine	21
Reconstructed	55
Repaired, Trapped, and Cleansed	590
Slop-pipes Disconnected	38
Down-spouts and Eaves-gutters Repaired	283

16.—Houses Unfit :

Demolished	40
Closed	57
Made Fit	15
Repaired	23

Sanitary Staff.—A slight alteration in the staff has again taken place, owing to the illness of the Chief Inspector, Mr. J. R. Thompson, and the resignation of one of the District Inspectors. Up till last year there was only one legally constituted Inspector of Nuisances, viz., Mr. R. Spencer, the inspector for meat, food, &c. By the Bolton Tramways and Improvement Act, 1897, the Council was empowered to appoint more than one, and, in consequence, all the Sanitary Inspectors are now legally constituted Inspectors of Nuisances. The districts are arranged thus—

Exchange Division Mr. J. McMillan.

Eastern { North..... }
 { East } Mr. Geo. Southern.
 { Church }

South Western... { Bradford ... }
 { Derby } Mr. Edward Oakes.
 { Rumworth . }

North Western . { Halliwell ... } Mr. Jno. Lord.
 { West }

The complete staff consists of—

- 1 Meat Inspector.
- 1 Chief Inspector.
- 4 District Inspectors.
- 1 Inspector (office work).
- 2 Clerks.
- 2 Disinfectors.
- 1 River Cleaner.
- 1 Urinal Cleaner.

General Sanitary Work.—Necessarily a great part of the work of the Inspectors consists of visits to infected houses and the abatement of minor nuisances. Especially is this the case in years when infectious diseases are prevalent. Besides the notifiable diseases, each of which is made the subject of a report, all deaths from measles, whooping-cough, and diarrhœa are visited, and the sanitary conditions of the house reported upon. On account of an epidemic of measles last year, the schools were frequently visited for information as to the number of absent scholars, and for the purpose of disinfection when necessary. When sanitary improvements are suggested, frequent visits are necessary to see that they are properly carried out; and many minor nuisances are abated after verbal notice from the Inspectors. A systematic house-to-house inspection is also made of a small district at a time, and it is hoped soon to include in this drain-testing, and a complete sanitary report of each house. Special work has also been done during the year, and is discussed under separate headings.

Insanitary Closets.—Bolton is one of the great towns in which privy-ashpits are still largely in use. Over a certain number of years the death-rate from diarrhœa and enteric fever in great towns has been shown to be nearly double of that in towns where water-closets are in use, and the subject of the conversion of this and other forms of the so-called dry closets into water-closets has been engaging the attention of Sanitary Authorities for several years.

These privy-ashpits or middens were in use in new houses in Bolton up till the year 1874, when pails were made compulsory. In 1887 "Gowanlocks," modified and covered privy-ashpits, were made the regulation, and in 1893 all new houses were placed on the water-carriage system. With some exceptions, these various systems have been adhered to during the periods mentioned, and it will therefore be easy to understand that many of the privy-ashpits are now in an insanitary and dilapidated condition. Moreover, many of them, on account of their close proximity to dwellings, are not only injurious to health, but also render the houses unfit for human habitation. During the last two years special inspections of closets have been made, and a list of 7,000 of the worst has been presented to the Sanitary Committee. The Council has confirmed the resolution to apply to the Local Government Board to borrow £10,000 to assist owners to convert these privy-ashpits into water-closets.

Under Article III., Provisional Orders Act, 1893, the Sanitary Authority has special powers with regard to the conversion of privies.

PROVISIONAL ORDERS ACT, 1893.

Conversion of Privies.—Article III.: “Sec. 80 of 1877 Act repealed, and in lieu thereof the following:—The Corporation may from time to time require any privy and ashpit of any house, the rateable value of which shall not exceed £25 per annum, or any privy or privy and ashpit used in common by the inmates of two or more houses, to be altered so as to be converted into a water-closet or slop-closet of such construction as the Corporation may approve, with a separate receptacle for ashes and house-refuse, and if the owner or owners of any such house or houses fail in any respect to comply with an order of the Corporation made under this section, the Corporation may, at the expiration of a time to be specified in the order, not being less than fourteen days after the service of the order, do the work specified in the order, and may recover in a summary manner from the owner or owners the expenses incurred by the Corporation in so doing.”

“Provided that if in any case such alteration, whether made by the owner, or on his default by the Corporation, shall be in respect of a privy or ashpit previously approved by the Corporation, or by the Halliwell Local Board of Health, and the cost of such alteration exceed the cost that would necessarily be incurred in putting such privy or ashpit in a proper state of repair, then if such privy or ashpit shall have been constructed with proper workmanship and materials, the Corporation shall bear the whole of that extra cost, but if such privy or ashpit shall not have been so constructed, then the Corporation shall bear one half only of such extra cost.”

Insufficient Closet Accommodation.—There are still some places in the borough where the accommodation is insufficient. In most the insufficiency is associated with congested areas and back-to-back houses where there is no room to erect additional closets without pulling down houses and reconstructing the area. In these cases the notices have been held over for a time. In other places I see no reason why the nuisance should not be abated at once.

By the Public Health Act, 1875, the Sanitary Authority can insist upon one closet for every two houses, but the custom in Bolton has been to demand only one for every three houses.

The following are the numbers for each ward where there are more than three houses to one closet:—

Exchange Ward	...	...	11
Bradford	„	...	21
Derby	„	...	25
East	„	...	14
North	„	...	1
Church	„	...	1
West	„	...	9
Halliwell	„	...	1

The power to deal with the question is given by the following sections:—

PUBLIC HEALTH ACT, 1875.

SECTION 36.—"If a house within the district of a local authority appears to such authority by the report of their surveyor or inspector of nuisances to be without a sufficient water-closet, earth-closet, or privy and an ashpit, furnished with proper doors and coverings, the local authority shall, by written notice, require the owner or occupier of the house within a reasonable time therein specified, to provide a sufficient water-closet, earth-closet or privy, and an ashpit furnished aforesaid, or either of them, as the case may require.

"If such notice is not complied with, the local authority may, at the expiration of the time specified in the notice, do the work thereby required to be done, and may recover in a summary manner from the owner the expenses incurred by them in so doing, or may by order declare the same to be private improvement expenses. Provided that where a water-closet, earth-closet or privy has been, and is used in common by the inmates of two or more houses, or if in the opinion of the local authority a water-closet, earth-closet or privy may be so used, they need not require the same to be provided for each house."

BOLTON IMPROVEMENT ACT, 1877.

SECTION 86.—"If, in the opinion of the Corporation, any court or place be without sufficient privy or ashpit accommodation, the Corporation, for the purpose of supplying the same, may from time to time take by agreement any land or building and remove or alter such building and execute all necessary works, and the owners of such houses in the court or place as are benefitted thereby shall be liable to pay the expenses incurred by the Corporation in the execution of this section, and the amount thereof shall be apportioned among these owners by the surveyor and the amount apportioned to each owner shall be payable by and recoverable from him. Provided that if any owner deems himself aggrieved by the decision of the Corporation as to the amount of such expenses or the apportionment thereof, he may appeal to the Local Government Board under the provisions of Section 268 of the Public Health Act.

Insanitary and Obstructive Buildings.—Power is given to the Sanitary Authority by the Bolton Improvement Act, 1872, and the Housing Working Classes Act, 1890, on the representation of their Medical Officer of Health, (1) To close houses certified to be unfit for human habitation, (2) To demolish houses declared to be obstructive buildings. In the first class of cases action is taken under the Bolton Improvement Act, 1872, but it is very seldom necessary to resort to the legal notice, as owners are generally willing to do what is required, and in such cases therefore a private notice is served on the owner, giving details of the insanitary conditions which render the house unfit for habitation. Where the house cannot be made fit it is closed and used for purposes other than a dwelling house. In the case of obstructive buildings legal notices have to

be served on account of the compensation to be paid to the owner. During the year 1897 there were served—

- 32 private or informal notices to make fit.
- 6 legal notices to close until made fit.
- 6 „ „ to demolish as obstructive.

The actual work accomplished during the year was as follows—

- 34 demolished.
- 6 demolished voluntarily by owner.
- 13 closed.
- 44 closed voluntarily.
-
- 97 total vacated.
- 15 made fit.
- 18 in hand.

In most of the cases the notices had been served in 1896. Those closed voluntarily are correctly placed in this list as they had already been scheduled as unfit for habitation. Twenty-six of the houses demolished belonged to an insanitary area in Back Foundry Street, three others were demolished in 1896, and the total 29 have been removed, and the scheme completed.

£1,996 was paid in compensation for demolition during 1897 as compared with £902 in 1896.

Future Work.—According to the census 1891 there were in the Borough of Bolton 186 single houses and 2,313 back-to-back houses; and although many of these have been demolished and some improved, there still remains a considerable number which are without thorough ventilation or proper yard space. In table xxv. further details are given with respect to this class of houses in Bolton and the 33 great towns.

In 1882 the sum of £6,000 was borrowed for the demolition of insanitary property, and as this sum has now been expended, powers were obtained in the Bolton and Tramways Improvement Act, 1897, to borrow more for the same purpose. In pursuance of this authority the Sanitary Committee have resolved to apply to the Local Government Board for the loan of £20,000; and this resolution having been confirmed by the Council a scheme has been prepared and forwarded to the Local Government Board for the demolition of 700 houses.

The Committee propose to deal with these in detail over a number of years, and if possible, in conjunction with street improvements. This will not only be a great sanitary improvement in itself, but will enable them to deal more effectually with insanitary property in the neighbourhood of the houses to be demolished.

The table following gives details of houses demolished and closed and cost of demolition from 1886 to the present time.

TABLE XXIV.

Houses Demolished or Closed and amount paid in
Compensation, 1886—1897.

Year	Amount Disbursed			Demolished	Closed
	£	s.	d.		
1886	110	12	0	...	10
1887	385	7	2	...	...
1888	Nil			25	...
1889	393	15	0	...	3
1890	350	0	0	21	...
1891	234	0	11	...	1
1892	76	8	2	...	...
1893	Nil			...	...
1894	Nil			...	16
1895	86	8	8	...	...
1896	902	0	0	26	10
1897	1996	0	0	40	57
	Amount paid for Ground Rent Capitalised.				
1890	255	18	5		
1895	176	0	0		

TABLE XXV.

Tenements in 33 Great Towns.

(From the Census, 1891)

Cities and Boroughs	Total Tene- ments	No. of Tene- ments with less than 5 Rooms	Percen- tage of Tene- ments with less than 5 Rooms	Number of Persons Occupying				Total
				1 room Tene- ments	2 room Tene- ments	3 room Tene- ments	4 room Tene- ments	
London	937606	630569	67.2	416489	708942	664343	593378	2383152
West Ham.....	42921	2570	5.9	4434	12866	34605	44732	96637
Croydon	20672	5099	24.6	1222	2900	3700	10368	18190
Brighton	25340	10168	40.1	3965	7957	7738	12387	32047
Portsmouth.....	33980	9435	27.7	1991	5918	6792	14066	28767
Plymouth	19647	14385	73.2	11301	19835	12113	7693	50942
Bristol	48140	23826	49.2	7799	21190	24863	28640	82492
Cardiff.....	25353	9117	35.9	969	9933	7997	14695	33594
Swansea	18321	9014	49.2	940	7761	5577	24139	38417
Wolverhampton.....	16262	8454	51.9	127	5152	6362	27436	39077
Birmingham	98219	57147	58.1	2307	13650	165264	73940	255161
Norwich	22837	7753	33.9	794	4745	7396	14949	27884
Leicester.....	36147	9042	25.0	209	6617	4266	23058	34150
Nottingham	46532	14874	31.9	877	4178	22658	28274	56287
Derby	19371	4882	25.2	154	1927	3077	14244	19402
Birkenhead.....	19665	7611	38.7	2177	4913	5362	18480	20932
Liverpool	104890	51135	48.7	18627	40460	61620	89410	210117
Bolton	23663	16364	69.1	115	7430	4279	63007	74831
Manchester.....	103720	57463	55.4	3694	34650	23423	189614	251381
Salford	40702	22633	55.6	2041	15378	7222	75025	99666
Oldham	27605	21076	76.3	478	7947	2594	83998	95017
Burnley	18047	12876	71.3	1118	6072	5254	45333	57777
Blackburn	24682	15793	63.9	238	1870	1496	67150	70754
Preston	22679	10439	46.0	177	1711	5099	36281	43268
Huddersfield	21018	14923	71.0	2754	16441	24921	18566	62682
Halifax	20244	13927	68.7	2540	20274	17108	15810	55732
Bradford.....	46408	33149	71.4	2855	32680	63309	46461	145305
Leeds	78779	52500	66.6	3010	49068	75195	97888	225761
Sheffield	67501	37770	55.9	9-6	15134	73576	77664	167300
Hull.....	43595	24931	57.1	2308	11178	20445	67130	101061
Sunderland	27594	21727	78.7	6599	34133	36586	17780	95098
Gateshead	17470	14961	85.6	5927	29271	20439	14325	69966
Newcastle-on-Tyne..	37942	19985	52.6	15851	51607	38418	29405	135281

Common Lodging Houses.—In the report for 1896 a summary was given of the sanitary condition of these houses. Each room was re-measured and a considerable reduction made in the number of beds; notice was given that no two persons of the same sex above 8 years of age would be allowed to sleep in the same bed, isolation of couples was insisted upon, and several notices were served for the repair of the houses and the abatement of nuisances. These improvements have all been readily carried out and the common lodging-houses may now be considered to be in a fairly satisfactory condition. A much higher standard will now be required in any house for which application is made to be placed in the register, and in fact only one has been registered during 1897.

Regular and systematic visits are made by the Inspectors who are responsible for keeping them in a proper state of efficiency. A new set of bye-laws has been sanctioned by the Local Government Board.

The common lodging-houses in each ward, the number of rooms, and the accommodation are as follows :—

Ward.	Houses.	No. of Rooms.	Accommodation.
Exchange	40	145	600
East	25	129	583
Church	1	8	38
Derby	1	11	45
Borough	67	293	1266

Houses Let in Lodgings.—The Local Government Board has sanctioned a set of bye-laws, and these will shortly be in force in the Borough, when a register of this class of houses will be made and regular inspection undertaken. Up till now these houses have not been liable to be inspected by the Sanitary Officials except as ordinary dwelling houses.

Vans, Tents, and Sheds.—84 Vans came under the notice of the Inspectors during the year, but neither infectious diseases nor nuisances were found. The Scavenging Department made special arrangements with regard to the removal of refuse.

Canal Boats.—Mr. George Southern, one of the District Inspectors, is the Canal Boats' Inspector, and he reports that 24 boats came into the Borough during 1897, and that he was able to inspect 23 of them. Two required painting and repairing. There was no infringement of the Acts and Regulations, no infectious disease, and no legal proceedings were taken.

The cargoes conveyed were china clay, bark for tanning purposes, and wood-pulp for paper making.

Factories and Workshops.—A report on the sanitary condition of factories is nearly completed, that is so far as it concerns the Sanitary Authority's duties. These duties include the inspection of (1) sanitary conveniences; (2) means of escape in case of fire; (3) nuisances. By the Factory and Workshops' Act, 1895, the Sanitary Authority is com-

pelled not only to act on the complaint of the District Factory Inspector and the Home Office Inspectors, but the nuisance complained of has to be remedied within a month, this rule applying both to workshops and factories. Except on the invitation of the Factory Inspector the Sanitary officials are not responsible for the interior of factories, but in workshops ventilation, overcrowding, cleanliness are all under their supervision in addition to those mentioned, viz., sanitary conveniences and fire escapes. The Home Office has recently fixed a standard number for sanitary conveniences, viz., 1 for every 25 or under of each sex, and it is advisable for the Sanitary Authority to work to that standard. According to the Factory Acts "sufficient and suitable" conveniences have to be provided, the interpretation of "suitable" being left to the Sanitary Authority. On the registers in the Sanitary Department there are at present, excluding bakehouses :—

163 factories.

586 workshops.

I am not yet prepared to say in how many of the factories the sanitary conveniences are not "sufficient and suitable," but as to other defects the following have been found :—

65 cesspools.

24 without fire-escapes.

Both factories and workshops have been regularly inspected, many nuisances have been abated and several improvements made. Before the end of 1898 I hope to be able to present to the Committee a complete sanitary survey of both. Meantime the Committee will appreciate, I am sure, the amount of work and responsibility laid upon the sanitary officials in a large manufacturing town like Bolton.



Bakehouses.—A revision of the whole of the bakehouses in the Borough has been made during the year, and their present sanitary condition has been entered in a register. It may be an advantage to quote here some sections of the Factory and Workshops' Acts applicable to this class of workshops.

Definition.—Sec. 18., Factory and Workshops' Acts, 1883.—“Retail bakehouse means any bakehouse or place, the bread, biscuits or confectionery baked in which are not sold wholesale, but by retail in some shop or place occupied together with such bakehouse.”

Powers of Medical Officer of Health.—Sec. 17, Factory and Workshops' Act, 1883.—(1) “As respect every retail bakehouse the provisions of this part of this Act and of the Sections 3, 33, 34 and 35 of the Factory and Workshops' Act, 1878 (which relate to cleanliness, ventilation, overcrowding and other sanitary conditions) shall be enforced by the local authority of the district in which the retail bakehouse is situate and not by an inspector under the Factory and Workshops' Act, 1887, and for the purpose of this section the Medical Officer of Health of the Local Authority shall exercise all such powers of entry, inspection, taking legal proceedings and otherwise, as an inspector under the Factory and Workshops' Act, 1878.”

Notice of Opening.—Sec. 26, Factory and Workshops' Act, 1891.—“(1) Sec. 75 of the principal Act (which requires notice to be given of the occupation of a factory) shall apply to a workshop (including any workshop conducted on the system of not employing any child, young person, or woman therein) in like manner as it applies to a factory.”

This notice has to be served within one month from the date of occupation.

Notice of Existing Bakehouse.—Sec. 41, Factory and Workshops' Act, 1895.—“Every person who is in occupation of a workshop at the commencement of the Act shall, before the expiration of twelve months from the commencement of this Act, unless he has already done so in pursuance of Section 26 of the Act of 1891, serve on the inspector for the district a written notice containing the name of the workshop, the place where it is situate, the address to which he desires his letters to be addressed, the nature of the work and the name of the person or firm under which the business of the workshop is carried on, and in default shall be liable to a fine not exceeding five pounds. Any notice so served shall be forthwith forwarded to the Sanitary Authority of the district in which the workshop is situate.”

The Factory Inspector of the district interprets Sec. 17, Factory and Workshops' Act to mean that notices of opening or of existing bakehouses should be sent to the Medical Officer of Health.

Underground Bakehouses.—Sec. 27, sub-sec. 2, Factory and Workshops' Act, 1895.—“A place underground shall not be used as a bakehouse unless it is so used at the commencement of this Act, and if any place is so used in contravention of this Act, it shall be deemed to be a workshop not kept in conformity with the principal Act.” The Factory and Workshops' Act, 1895 came into operation on January 1st, 1896.

Penalty.—Sec. 16, Factory and Workshops' Act, 1883. "Where a court of summary jurisdiction is satisfied on the prosecution of an inspector or a local authority that any room or place used as a bakehouse (whether the same was or was not so used before the passing of the Act) is in such a state as to be on sanitary grounds unfit for use or occupation as a bakehouse, the occupier of the bakehouse shall be liable on summary conviction to a fine not exceeding forty shillings, and on a second or any subsequent conviction not exceeding five pounds."

TABLE XXVI.

Bakehouses in Wards.

Ward	Total	Ground Level		Underground	
		Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
Exchange	27	10	2	9	6
Bradford.....	29	14	6	5	4
Derby	19	9	2	6	2
Rumworth	3	2	...	1	...
North	6	4	...	1	1
East.....	18	10	3	2	3
Church	14	10	...	2	2
Halliwell.....	10	7	...	2	1
West	25	18	2	4	1
	151	84	15	32	20

It will be seen from the accompanying table that 52 out of 151 bakehouses in the Borough are underground, and that 15 of those above the ground level are in an unsatisfactory condition.

The conditions necessary for a sanitary bakehouse are the following :—

1. Walls and floors in good state of repair.
2. Good lighting and ventilation.
3. Drain inlets (if any) properly and efficiently trapped.
4. No nuisances in close proximity to the bakehouse.
5. Clean state of tables, troughs, &c.

The sanitary condition generally found wanting in those considered unsatisfactory was good lighting and ventilation, and especially was this the case in those underground. In several the walls and floors were not smooth and even enough, and would not therefore permit of being properly cleaned or whitewashed, and in others dirty storerooms were not efficiently shut off from the bakehouse. In the underground bakehouses there was no idea of ventilation, except through window openings at the street level, which, of course admitted every conceivable kind of filth as well.

New underground bakehouses are forbidden by Sec. 28, Factory and Workshops' Act, 1895, and the present ones will have to be much improved before they can be considered on sanitary grounds fit for use or occupation. There are three bakehouses in the Borough models of what a bakehouse should be.

I have only just been able to finish the inspection of the bakehouses, and therefore no steps have yet been taken to improve their condition. As the alterations, especially of the underground ones, will be difficult, the subject will have to be carefully considered, and I shall, in the first place, make suggestions for alterations to the occupiers, and where these cannot be carried out, it may be necessary to close them.

Shop Hours Act, 1892-1895.—These Acts impose on the Sanitary Authority the duty of reporting to the Factory Inspector the employment of young persons under the age of 18 years who are employed for a longer period than 74 hours in one week (including meal times), and of seeing that in every place where a young person is employed a notice is kept, exhibited by the employer in a conspicuous place, referring to the provisions of the Act of 1892.

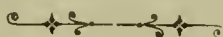


TABLE XXVII.
Offensive Trades.

No.	Trade	Exchange	Bradford	Derby	Rumworth	North	East	Church	Halliwell	West	Borough
1	Blood Boiler .....	...	...	...	...	...	...	1	...	...	1
2	Bone „ .....	...	...	...	...	...	...	...	...	...	...
3	Fellmonger.....	1	1	...	...	...	1	...	...	1	4
4	Soap Boiler .....	...	...	...	...	...	...	...	...	...	...
5	Tallow Melter	1	...	...	...	...	...	...	...	...	1
6	Tripe Boiler	3	3	1	...	...	3	2	...	...	12
7	Rag Storer .....	...	...	...	...	...	...	...	...	...	...
8	Knackers Yard .....	...	...	...	...	...	...	1	...	...	1
9	Chemical Works .....	...	...	1	...	...	1	2	...	...	4
10	Tanners .....	...	...	...	...	...	...	1	...	...	1
Total		5	4	2	...	...	5	7	...	1	24

Slaughterhouses.—A report on the slaughterhouses was presented to the Committee during the year. They were found in a satisfactory condition, and all in accordance with the bye-laws, except four, which were due to minor defects; two from insufficient height and two from defective floors. The insufficient height is compensated for by the larger area of the two slaughterhouses, and the defective floors have been made good. Forty-one of the slaughterhouses are registered, and seven are permissive. Of these latter, two during the year have applied for and obtained a yearly licence.

Mr. Spencer has regularly inspected also the cowsheds, milkshops, &c., details of which are given in the accompanying tables :—

TABLE XXVIII.

Registered Cowsheds, Dairies, Milkshops, and Slaughterhouses.

Ward	Cowsheds	Dairies and Milkshops	Milkshops Registered 1897	Slaughter- houses	Slaughter-houses Licensed during 1897
Exchange .....	...	31	5	6	...
Bradford.....	3	57	1	23	2
Derby	2	45	5	2	...
Rumworth	4	14	2	1	...
North .....	...	18	3	1	...
East.....	...	47	3	3	...
Church	2	22	1	3	...
Halliwell.....	5	27	3	5	...
West	2	50	2	4	...
Borough	18	311	25	48	2

16 of the slaughterhouses in Bradford Ward are public, belonging to the Corporation.

Unsound meat and Unwholesome Food.—

Months.			Carcases. Meat in pounds.	
January	...	...	1	510
February	...	...	1	1360
March	...	...	5	1220
April	...	...	4	320
May ...	...	...	3	1150
June	...	...	5	546
July ...	...	...	2	680
August	...	...	3	1085
September	...	...	3	1710
October	...	...	3	1120
November	...	...	1	540
December	...	...	5	964
Total	...	...	36	11215

Of the 36 carcasses destroyed, 35 were surrendered by the owners, and only one was seized.

There were also destroyed $15\frac{1}{2}$ cwt. of fish, 2183 lbs. of fruit, 98 rabbits, 120 fowls, 15 bags of cockles, 67 beasts' livers, 56 beasts' bellies.

Cattle Inspection.—During the year there were the following inspections :—

6,750 of beasts.
 37,280 of sheep and lambs.
 1,584 of calves.
 18,690 of pigs.
 1,711 of store cattle.
 8,381 of slaughterhouses, butchers' shops, cowsheds, &c.



Smoke Abatement.—The four District Inspectors, who include smoke inspection with their other duties, took 381 observations of chimneys. Sixty-four of these were reported as nuisances, that is, emitted black smoke for more than $2\frac{1}{2}$ minutes in the half-hour. The Sanitary Committee ordered 21 notices to be served to abate, and took legal proceedings in 22 cases. There were 17 convictions, the fines varying from 5 to 40 shillings; making a total of £6 5s. When the Inspectors are more familiar with their new districts a much larger number of observations will be taken, they will become better acquainted with the chimneys, and while taking regular observations of every one, will take frequent and repeated observations of the worst offenders. The nuisances reported are somewhat in excess of the average for the last five years. Whether this is due to an increase of the smoke nuisance or to more accurate observations I am not able to decide; but from facts which I have obtained, and which I shall now place before you, I am of opinion that the present rate of progress in the abatement of the smoke nuisance is not sufficiently rapid, especially in Bolton, which has always taken a foremost place among manufacturing towns in this matter. I think, therefore, that it will not be unprofitable to shortly review the subject. The Bolton Sanitary Committee obtains its powers from the following Acts:—

PUBLIC HEALTH ACT, 1875.

Sec. 91. (A) “Any fireplace or furnace which does not as far as practicable consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatever; and

(B) “Any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such a quantity as to be a nuisance, shall be deemed to be a nuisance liable to be dealt with summarily in manner provided by this Act, provided—

“That where a person is summoned before any court in respect of a nuisance arising from a fireplace or furnace which does not consume the smoke arising from the combustible used in such fireplace or furnace, the court shall hold that no nuisance is created within the meaning of this Act, and dismiss the complaint, if it is satisfied that such fireplace or furnace is constructed in such manner as to consume as far as practicable, having regard to the nature of the manufacture or trade, all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof.”

Sec. 105.—“Complaint may be made to a justice of the existence of a nuisance under the Act on any premises within the district of any local authority by any person aggrieved thereby or by any inhabitant of such district, or by any owner of premises within such district, and thereupon the like proceedings shall be had with the like incidents and consequences as to making of orders, penalties for disobedience of orders, appeal and otherwise, as in the case of a complaint relating to a nuisance made to a justice by a local authority.”

PROVISIONAL ORDERS CONFIRMATION (No. 15), ACT 1893,
ART. II.

Sec. 2. (a).—"If from any chimney, not being the chimney of a private dwelling-house, black smoke is emitted in such quantity as to be a nuisance, or where the best practicable means for preventing such emission are not in use, the Corporation may on complaint by any person aggrieved, or by two inhabitant householders of the Borough shall cause notice to be given to the owner or occupier of the land on which the chimney is situate, or to the owner or occupier of the furnace or fireplace in connection with which such chimney is used, to discontinue such emission, and if after such notice the emission is repeated such owner or occupier shall for such offence be liable to a penalty not exceeding five pounds, or on each subsequent conviction to a penalty not exceeding twenty pounds."

(b).—"Where more fireplaces or furnaces than one communicate with a single chimney or a chimney is used in connection with more fireplaces or furnaces than one, the names of the several owners or occupiers of the buildings or land on which such fireplaces, or furnaces, or chimney are situate may be included in one summons, and the justice or justices before whom the case is brought may, in his or their discretion, apportion the penalty between the several owners or occupiers, as the case may be, or impose a penalty on one or more of such owners or occupiers to the exclusion of the others."

It will be noticed according to the sections of the Public Health Act, 1875, that the owner of "any fireplace which does not, as far as practicable, consume the smoke," or the owner of "any chimney sending forth black smoke in such quantities as to be a nuisance" can be prosecuted in the same manner as other nuisances. Moreover "any person aggrieved, or any inhabitant or any owner of premises within such district," may lay a complaint before the magistrates, without previous notice to the owner of the chimney. The Act does not require proof of injury to health, but only an accurate observation of the chimney. Hitherto most of the legal proceedings against manufacturers have been taken on account of the emission of black smoke for more than $2\frac{1}{2}$ minutes in the half-hour, but I want to emphasise the fact that proceedings can also be taken for not consuming the smoke "as far as practicable," and to suggest that occasionally it would be the better method to adopt, in view of the facts that are given in table xxix. In 17 chimneys belonging to various firms the smoke is consumed so effectually as to reduce the emission of black smoke to *less than one minute in the half-hour*, and in most of the observations there has been no black smoke at all.

Some of this information was given in the Medical Officer of Health's Report for 1892, but I have verified all the details given in the table from information kindly supplied to me by the owners and managers. From some of the firms information as to the annual cost and the saving in coals was refused, but in those who have supplied it the annual cost for repairs seems to be balanced by the saving in coals. The proprietor of one of the firms on this smokeless list, who was a great offender a few years ago, now writes:—"We find this mode of firing to be satisfactory as we get a more

regular steam pressure, which is advantageous in the running of our engines. We also do away to a considerable extent with smoke which we may say we only find when the apparatus requires repairing."

The duties of the Sanitary Inspectors, with regard to the smoke nuisance, are given in the following directions issued by the Sanitary Committee :—

1. Whenever an Inspector sees a chimney sending out black smoke in large quantities, he is to make a note thereof in his pocket book.
2. As early as possible thereafter the Inspector in whose district the chimney is situated is to take a thirty minutes' observation of the chimney, and record the usual particulars in his note book of such observations.
3. If black smoke issued from the chimney for as much as $2\frac{1}{2}$ minutes of the half-hour, the Inspector at the close of his observation should enter the works to which the chimney belongs with a view of ascertaining the cause of the nuisance, and he should make a note of what he sees and is stated to him there.
4. On returning to the office, enter in the smoke observation book, particulars of the observation, make a copy thereof on the usual form and send such copy by post to the occupier of the works, or a copy of the observation may be left at the works.
5. Enter the nuisance in the smoke report book for the next meeting of the Sanitary Committee.
6. As soon as possible after the Council meeting serve the usual notice to abate.

At the time of observation the following enquiries are made at the works :—The number of boilers, the number at work, the mechanical apparatus (if any) used on each furnace, whether in working order, whether hand-fired, the names of the firemen. In some cases objection has been taken to these enquiries and the Inspector has been refused admission to the works, and it is for this reason that I have stated the duties as clearly defined by the Sanitary Committee.

The advantage of a pure atmosphere to the inhabitants of a large town like Bolton cannot be overestimated. It may be taken as conclusively proved that the smoke nuisance can be abolished in the great majority of cases. Let us hope then that those who are still in default will take a lesson from those who are showing such a good example, and that in the near future a manufacturer will consider it a personal disgrace to have smoke in any quantity issuing from his chimney top.

TABLE XXIX.
Smokeless Chimneys.
 (Less than one minute's black smoke in the half-hour.)

No.	Situation	Manufacture	No. of Boilers	Apparatus	Cost per Boiler	Annual Cost per Boiler for Repairs	Amount of Coal Saved per Boiler per Week	Number of Years in Use
1	C. & W., No. 1 Mill, Lever Street ...	Cotton Spinning	3	"Coking" Stoker	...	...	...	8
2	C. & W., No. 2 Mill, Lever Street...	do.	3	do.	...	...	...	5
3	C. & W., No. 3 Mill, Lever Street...	do.	4	do.	...	...	...	5
4	C. & W., No. 4 Mill, Gilnow ...	do.	4	do.	£80	...	...	6
5	C. & W., No. 5 Mill, The Pike, High Street ...	do.	4	do.	...	...	...	5
6	B. & J., No. 1, Prospect Mill, Prospect Street ...	do.	1	do.	£90	£26	...	5
7	B. & J., Nos. 2 and 3, Prospect Mill, Prospect Street ...	do.	6	do.	£90	£26	...	5
8	B. & J., No. 2, Albert Mill, Higher Bridge Street ...	do.	5	do.	£120	...	...	5
9	D. St. Sp. Co. ...	do.	2	do.	£88	£17 10s.	1 to 1½ tons	3

TABLE XXIX.—*Continued.*

Smokeless Chimneys.

No.	Situation	Manufacture	No. of Boilers	Apparatus	Cost per Boiler	Annual Cost per Boiler for Repairs	Amount of Coal Saved per Boiler per Week	Number of Years in Use
10	G. & S., Nos. 1 & 2, Halliwell Mills ...	Cotton Spinning	5	Mechanical Stoker	£120	£5	2 tons	2
11	H., Nos. 1 and 2, Vernon Street Mills ...	do.	2	"Coking" Stoker	£110	£8	2 tons	3
12	J. M. & Co., No. 1, Chorley Old Road ...	do.	4	Automatic Louvre Doors and Mercury Box	...	...	...	5
13	J. M. & Co., No. 2, Chorley Old Road ...	do.	3	Steam Blowers Hand Firing	£60	£3	...	3
14	J. M. & Co., No. 4, Chorley Old Road ...	do.	6	do.	£60	£3	...	3
15	J. M. & Co., No. 7, Chorley Old Road ...	do.	2	do.	£60	£3	...	3
16	M. Sp. Co., Halliwell Road... ..	do.	2	"Coking" Stoker	£110	£10	1½ to 2 tons	3
17	C. S. Bridge Street	Electrical Works	1	do.	...	...	...	½

TABLE XXX.
Smoke Nuisances, 1897.

Date	Firm	Trade	Minutes of Black Smoke emitted during $\frac{1}{2}$ -hour	Remarks
Jan. 13	L. H. & Ltd...	Cotton Spinners	5	No. 1 Mill, 2 boilers, Meldrum's patent.
15	M. S.	Pork butcher	15	No. 2 Mill, 3 boilers (only 2 working), Whittaker's stokers.
22	do.	do.	8	
Feb. 20	do.	do.	5	Vertical boiler, no mechanical apparatus.
Nov. 6	do.	do.	5	
Jan. 19	M. P. Co., Ltd.	Cotton spinners	4	
21	do.	do.	3	1 boiler, Hodgkinson's stokers.
June 2	do.	do.	6	
Jan. 28	J. M. & Sons, No. 3 Mill	Cotton spinners	6	4 boilers, Proctor's stokers, perforated doors.
June 4	do. No. 3 Mill	do.	5	
Jan. 28	do. No. 4 Mill	do.	6	4 boilers, Hodgkinson's stoker, perforated doors, hand-fired occasionally.
June 4	do. No. 4 Mill	do.	17	
Feb. 10	W. & B.	Cotton spinners	3	2 boilers, Roscoe's patent split bridge, and louvred doors.
Oct. 21	do.	do.	4 $\frac{1}{2}$	
Feb. 25	P. S. R. & D. H.	Electro-plate works.	4	Vertical boiler, smoke goes into house flue.
Mar. 2	W. R.	Iron founder	3	2 boilers, 4 furnaces, hand-fired, louvred doors.
15	J. H. & Co., Ltd.	Cotton spinners	4 $\frac{1}{2}$	No. 1 Mill, 3 boilers, 6 furnaces, hd.-fired, louvred doors, only 1 blr. wkg.
15	do.	do.	3 $\frac{1}{2}$	No. 2 Mill, 3 boilers, 6 furnaces, hd.-fired, lvd. drs. & rocking bars, not wkg.
April 8	T. T. & Co.	Cotton weavers	3	1 boiler, 1 furnace, hand-fired, air-box attached.
July 7	do.	do.	3 $\frac{1}{2}$	2 boilers, hand-fired.
May 3	J. R. & J., Ltd.	Cotton doubler	3	2 boilers, 4 furnaces, Meldrum's patent draught.
4	B. & S.	Cotton spinners	4	
17	do.	Bleachers	9 $\frac{1}{2}$	
June 3	do.	do.	3 $\frac{1}{2}$	
25	do.	do.	8	
Oct. 13	do.	do.	15 $\frac{1}{2}$	7 boilers, 14 furnaces, Thornley's bars and split bridge, louvred doors, hand-fired, fitting one furnace with Booty's patent.
Nov. 8	do.	do.	5 $\frac{1}{2}$	
17	do.	do.	11 $\frac{1}{2}$	
May 17	O. H. & Co., Ltd., Weston-st.	Cotton spinners	7 $\frac{1}{2}$	
Sep. 21	do.	do.	4	6 boilers, 12 furnaces, steam jets, and rocking bars.
Dec. 16	do.	do.	4	3 boilers, 6 furnaces, no mechanical apparatus.

Smoke Nuisances, 1897.

Date	Trade	Firm	Minutes of Black Smoke emitted during $\frac{1}{2}$ -hour	Remarks
May 18	B. I. & S. Co., Ltd.	Iron founder	6 $\frac{1}{2}$	} Open furnaces.
Sep. 21	do.	do.	4	
June 3	C. & D.	Cotton spinners	3	
Sep. 14	do.	do.	3	} 3 boilers, rocking bars, and Hodgkinson's stokers.
June 3	J. T. & Son	Cotton spinners	12	
Dec. 13	do.	do.	3 $\frac{1}{2}$	
June 10	J. K. & Son, Ltd.	Cotton spinners	3 $\frac{1}{2}$	} 3 boilers, 6 furnaces, louvred doors and rocking bars.
July 2	F. & A. B.	Bleachers	5 $\frac{1}{2}$	
13	W. C. & Sons, Ltd.	Iron founders	3	
13	W. B.	Corn miller	3	} 2 boilers, 4 furnaces, louvred doors worked by mercury, and steam jet.
18	B. C., Elec. Depart.	Electrical works	5 $\frac{1}{2}$	
Sep. 14	do.	do.	6	
Aug. 13	H. & H.	Spindle makers	4	} 2 boilers, 2 furnaces to each boiler, Meldrum's forced draught.
19	T. S.	Builder	3 $\frac{1}{2}$	
Sep. 9	J. H. & Co.	Tar distiller	7	
Oct. 21	do.	do.	4	} 1 still, 1 furnace, hand-fired, no mechanical apparatus.
Sep. 10	T. & J. H.	Brick makers	11	
14	W. K.	Timber merchant	4	
Dec. 17	do.	do.	4	} 1 boiler, Meldrum's draught, hand-fired.
Sep. 20	S. S. & Son, Ltd.	Colliery	5	
22	R. W. & Co.	Iron founders	12 $\frac{1}{2}$	
Oct. 5	C. T. Bros., Ltd.	Cotton spinners	3	} Forge, 1 boiler, 17 puddling-furnaces and 4 heating furnaces.
6	B. S. Co., Ltd.	Cotton spinners	3	
6	J. T.	Brewer	5 $\frac{1}{2}$	
7	W. S. B. Co., Ltd.	Brewers	12 $\frac{1}{2}$	} 3 boilers (only 2 working), 6 furnaces, hand fired, louvred doors and Paddy's hollow bars.
12	W. H.	Baker	4	
13	J. M. & Sons, Ltd.	Iron founders	3 $\frac{1}{2}$	
19	M. M. & C., Ltd.	Brewers	3	} 2 iron ovens, 2 furnaces.
21	J. P.	Wheelwright	3	
Nov. 4	S. H. & N. G.	Hosiery manufacts.	4 $\frac{1}{2}$	
9	B. E. N.	Printers	7	} 1 boiler, 2 furnaces, no mechanical apparatus.
17	L. & Y. R. Co.	Hydraulic works	6	

Food and Drugs Act.—Ninety-two samples were submitted to me as Public Analyst during the year 1897, by the Inspector Mr. R. Spencer:—

Samples.	No.	Number adulterated.
Milk... ..	50	6
Skim milk	6	2
Butter	12	0
Coffee	10	6
Whisky	8	3
Gin	4	3
Brandy	1	0
Rum	1	0
Total	92	20

The details with respect to the adulterated articles and the action taken are given in the following table:—

Article.	Amount of adulteration.	Action taken.	Result.
1. Milk ...	3 p.c. added water	Cautioned	...
2. Milk ...	6 p.c. „ „	Prosecuted	Costs.
3. Milk ...	3 p.c. „ „	Cautioned	...
4. Milk ...	12 p.c. „ „	Prosecuted	£5 and costs.
5. Milk ...	14 p.c. „ „	Prosecuted	5s. and costs.
6. Milk ...	2 p.c. added water and 6 p.c. deficient in fat	Cautioned	...
7. Skim milk	17 p.c. added water	Prosecuted	£5 and costs.
8. Skim milk	17 p.c. „ „	„	10s. „
9. Coffee ...	50 p.c. chicory	„	2s. 6d. „
10. Coffee ...	34 p.c. „	„	5s. „
11. Coffee ...	51 p.c. „	„	5s. „
12. Coffee ...	45 p.c. „	„	Dismissed.
13. Coffee ...	47 p.c. „	„	5s. and costs.
14. Coffee ...	53 p.c. „	„	5s. „
15. Whisky ...	13 p.c. added water	„	} 10s. „
16. Whisky ...	20 p.c. „ „	„	
17. Gin ...	20 p.c. „ „	„	
18. Gin ...	1 p.c. „ „	Cautioned	...
19. Gin ...	12 p.c. „ „	Prosecuted	5s. and costs.
20. Whisky ...	7 p.c. „ „	„	5s. „

The value of milk depends upon the amount of solids it contains. The percentage of solids in the 50 samples of new milk submitted is shown below:—

Percentage of Solids.	No. of samples.
Under 11 ...	3
11 and under 11·5 ...	3
11·5 and under 12 ...	8
12 and under 12·5 ...	16
12·5 and under 13 ...	15
13 and over ...	5

TABLE XXXI.

Abstract of Public Analyst's Report, 1875—1897.

Years	No. of Samples	No. of Adulterations	Percentage of Adulterations	No. Prosecuted	No. Cautioned	No. Fined	Amount of Fines
							£ s. d
1875...	60	12	20	5	...	4	3 . 5 . 0
1876...	49	16	32	8	...	8	12 . 0 . 0
1877...	55	17	30	4	...	4	11 . 11 . 0
1878...	47	14	29	6	...	4	6 . 15 . 0
1879...	47	12	25	3	...	2	3 . 10 . 0
1880...	45	14	31	2	...	0	nil
1881...	43	12	28	2	...	1	5 . 0 . 0
1882...	35	5	14	0	...	0	n
1883...	46	14	30	2	...	0	nil
1884...	45	7	15	1	...	1	1 . 0 . 0
1885...	31	4	12	0	...	0	nil
1886...	32	12	37	1	...	0	nil
1887...	34	3	8	2	...	0	nil
1888... (a)	47	18	38	3	...	2	3 . 0 . 0
1889...	42	4	9	1	...	1	0 . 10 . 0
1890... (b)	23	1	4	0	...	0	nil
1891...	51	4	7	3	...	3	2 . 5 . 0
1892...	53	3	5	1	...	1	0 . 2 . 6
1893...	53	3	5	2	...	2	0 . 7 . 6
1894...	53	5	9	4	...	4	3 . 0 . 0
1895...	35	5	14	2	4	2	0 . 5 . 0
1896... (c)	73	8	10	7	1	6	2 . 8 . 6
1897...	92	20	21	16	4	15	12 . 17 . 6

(a)—14 of these were spirits.

(b)—6 months.

(c)—9 months.

Scavenging.—The following abstract of the work done in the Scavenging Department in 1897 has been kindly supplied by the Scavenging Committee through Mr. John Stewart, the Superintendent. The efficient and prompt removal of refuse from the neighbourhood of dwelling-houses is so important a factor in the sanitary condition of a town that I am pleased to be able to give these details and to bear testimony to the excellent manner in which the work is carried out.

The cost incurred seems to me very small for a large town like Bolton, and the disposal of the refuse is a matter for congratulation. Only 6,718 tons, consisting of incombustible refuse from the streets, has to be deposited in a "tip."

COLLECTION OF REFUSE.

51,451½ tons from closets and ashpits.
9,984½ tons from streets and markets.
1,281 tons from slaughterhouses.
1,273½ tons from lock-up shops.

63,990½

DISPOSAL OF REFUSE.

18,656 tons sold as manure to farmers.
6,718 tons tipped.
33,963¾ incinerated and used for mortar making.
4,652¾ tons surplus moisture drained into sewers.

63,990½

EXPENDITURE.

	£	s.	d.
Collection of refuse from closets and ashpits ...	6,319	0	9
Collection of refuse from streets and markets ...	4,705	18	5
Collection of refuse from slaughterhouses	170	0	2
Collection of refuse from lock-up shops	162	13	2
Total for collection	11,357	12	6

Incineration of refuse	1,239	4	8
Mortar making	1,915	5	3
Manure grinding	468	15	10
Wagon loading.....	867	7	5
	4,490	13	2
Total expenditure	15,848	5	8

INCOME.

Manure sales after paying £1,759			
18s. 4d. for railway carriage ...	799	3	4
Mortar sold (12,979 tons)	3,275	5	5
	4,074	8	9
Net cost	11,773	16	11

Mr. Stewart adds the following notes :—

“ **BOLTON GROUND MANURE.**—A mill-ground mixture of closets, streets and abattoir refuse. It has a very ready sale, so that the whole of the manurial collection is loaded into railway wagons and sent out nightly to the farmer customer.

“ **GROUND MORTAR.**—A mill-ground blend of best limes and destructor clinkers. It is smooth, tenacious, and of excellent quality. The business is expanding so rapidly that it is possible that in the near future there will not be clinker enough to supply the demand.

The number of men, horses and carts employed in the department are given in the following table :—

TABLE XXXII.
Average Daily No. of Men, Horses and Rolling Stock, 1897.

Work	Total Carts	Carts	Pail Carts	Excreta Vans	Barrow or Hand-carts	Sweeping Machines	Railway Wagons	Wagons	Water Carts	Horses	Men
Closets and Ashpits	44	16	10	4	14	...	...	...	...	26	64
Street Sweeping	37	14	...	...	12	6	...	...	5	16½	74
Abattoirs	1	1	...	...	...	...	...	...	...	1	2
Lock-up Shops	1	1	...	...	...	...	...	...	...	1	2
Depôt and Manure Works	136	9	...	...	14	...	78	35	...	2½	43
Falcon Yard (Stables and Workshops)	1	1 (Lurry)	...	...	...	...	...	...	...	...	21
Sewage Works	2	2	...	...	...	...	...	...	...	...	...
Total	222	44	10	4	40	6	78	35	5	46½	206

Hospital Expenditure, 1883—1898.

Items	1883-4	1884-5	1885-6	1886-7 9 mos.	1887-8	1888-9	1889-90	1890-1	1891-2	1892-3	1893-4	1894-5	1895-6	1896-7	1897-8
Wages	150	197	214	195	267	261	233	330	306	319	430	312	356	358	325
Rent and Rates, &c. ...	74	73	73	41	92	92	92	222	181	200	227	222	210	230	226
Gas and Water	67	94	118	130	181	208	187	90	57	38	83	70	79	70	56
Telephone	18	18	18	18	18	18	15	18	18	18	19	19	19	13	16
Food and Drugs	94	269	273	239	436	453	523	486	360	401	511	412	461	536	467
Bedding, Crockery, Iron- mongers, &c. ... ..	...	43	51	7	46	28	77	123	52	98	78	33	132	49	38
Painting and Repairs ...	...	16	67	37	242	84	73	73	375	238	161	166	64	155	137
Printing and Stationery ...	12	16	10	4	3	2	2	18	13	19	8	19	...	2	...
Cab Hire	59	44	32	26	9	11	10	50	38	47	57	52	47	31	26
Heating Apparatus ... ..	...	...	...	...	...	...	...	...	...	...	70	...	...	...	...
Sundries	23	...	9	7	59	21	26	45	58	56	78	57	89	70	48
Total	506	770	865	704	1353	1178	1291	1460	1458	1434	1722	1362	1457	1514	1339
Number of Patients admitted, April 1st to March 31st ... ..	...	67	131	186	292	279	292	267	106	181	185	117	234	270	258
Cost per Patient ... ..	...	£ s. d. 11 9 10	£ s. d. 6 12 0	£ s. d. 3 15 8	£ s. d. 4 12 8	£ s. d. 4 4 5	£ s. d. 4 8 5	£ s. d. 5 9 4	£ s. d. 13 15 0	£ s. d. 7 18 6	£ s. d. 9 6 2	£ s. d. 11 12 9	£ s. d. 6 4 6	£ s. d. 5 12 0	£ s. d. 5 3 9
Cost for Food and Drugs per Patient ... ..	...	4 0 3	2 1 8	1 5 8	1 9 10	1 12 5	1 15 11	1 16 4	3 7 11	2 4 3	2 15 2	3 10 5	1 19 4	1 19 8	1 16 2
Rate in the £	'35d.	'54d.	'60d.	'65d.	'93d.	'80d.	'36d.	'95d.	'93d.	'88d.	1'95d.	'82d.	'86d.	'89d.	'77d.

